PROJECT SPECIFICATIONS FOR THE SOIL INTERIM REMEDIAL ACTION AT THE RANDALL TEXTRON SITE GRENADA, MISSISSIPPI

Prepared for:

ROCKWELL INTERNATIONAL CORPORATION
TROY, MICHIGAN

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9300

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DIVISION 0 - BID AND CONTRACT INFORMATION

ROCKWELL INTERNATIONAL CORPORATION

INSTRUCTIONS TO BIDDERS

1. BIDS: BIDS SHALL BE SUBMITTED ON ATTACHED BID FORM, OR COPIES THEREOF, IN TRIPLICATE ENCLOSED IN A SEALED ENVELOPE. IF A SUPPLEMENTARY BID SHEET IS ATTACHED HERETO, THE BIDDER SHALL FILL IT IN AS APPROPRIATE, AND SUBMIT, IN TRIPLICATE, TOGETHER WITH THE BID FORM.

2. EXAMINATION OF CONTRACT DOCUMENTS, SITE AND WORKING CONDITIONS:

   BEFORE SUBMITTING A BID, BIDDERS SHALL CAREFULLY EXAMINE THE DRAWINGS, SPECIFICATIONS, AND FORM OF CONTRACT, AND SHALL VISIT THE SITE OF WORK AND FULLY INFORM THEMSELVES AS TO ALL CONDITIONS AND MATTERS WHICH CAN IN ANY WAY AFFECT THE WORK OR THE COST THEREOF. FAILURE TO DO SO SHALL BE AT THE BIDDER'S RISK.

3. RETURN OF DOCUMENTS:

   ALL DRAWINGS, SPECIFICATIONS AND SIMILAR DATA FURNISHED IN CONNECTION WITH THE INVITATION TO BID SHALL BE RETURNED TO ROCKWELL AT THE TIME OF SUBMISSION OF THE BID.

4. ADDENDA OR BULLETINS:

   ROCKWELL RESERVES THE RIGHT TO REVISE OR INTERPRET THE SPECIFICATION, DRAWINGS OR OTHER TERMS OF THE INVITATION TO BID PRIOR TO THE DATE INDICATED THEREIN FOR RECEIPT OF BIDS. SUCH REVISIONS OR INTERPRETATION, IF ANY, SHALL BE IN THE FORM OF ADDENDA OR BULLETINS IN WRITING, SHALL BE A PART OF THE INVITATION TO BID, AND SHALL BE FURNISHED TO ALL PROSPECTIVE BIDDERS. IN THE EVENT ANY SUCH REVISION IS OF SUCH NATURE AS TO NECESSITATE POSTPONEMENT OF THE BID RECEIPT DATE, THE ADDENDA OR BULLETINS SHALL INCLUDE AN ANNOUNCEMENT OF THE NEW DATE FOR SUBMISSION OF BIDS. EXCEPT AS PROVIDED ABOVE, NO INTERPRETATION RECEIVED FROM ANY REPRESENTATIVE OR ROCKWELL SHALL BE DEEMED TO VARY, ALTER, OR MODIFY THE PROVISIONS OF THE INVITATION TO BID.

5. ADDITIONAL INFORMATION:

   BEFORE THE CONTRACT IS SIGNED, AND NOT MORE THAN FIVE (5) CALENDAR DAYS AFTER A REQUEST THEREFOR BY ROCKWELL, THE BIDDER SHALL SUBMIT THE INFORMATION SPECIFIED BELOW. SUCH REQUEST SHALL NOT BE CONSTRUED TO BE WRITTEN NOTIFICATION OF BID ACCEPTANCE.

   (A) A COMPLETE LIST OF ALL PROPOSED SUBCONTRACTORS.

   (B) THE ERECTION SCHEDULE.

   (C) OTHER REQUIRED INFORMATION AS SPECIFIED.

6. REQUESTS FOR SUBSTITUTION AND RECOMMENDATIONS CONCERNING ALTERNATES FOR EQUIPMENT, MATERIALS OR ARTICLES REFERRED TO IN THE SPECIFICATIONS SHALL BE SUBMITTED BY THE BUILDER TO ROCKWELL IN WRITING WITHIN 30 DAYS AFTER EXECUTION OF THE CONTRACT.

PERFORMANCE AND PAYMENT BOND:

(A) THE SUCCESSFUL BIDDER SHALL, UNLESS OTHERWISE SPECIFIED BELOW, IN THE ENCLOSURES HERETO, OR IN WRITING BY ROCKWELL AT THE TIME OF ACCEPTANCE OF THE BID, BE REQUIRED TO FURNISH A PERFORMANCE AND PAYMENT BOND IN THE AMOUNT OF THE CONTRACT PRICE AND IN THE FORM ATTACHED HERETO.

(B) IF THE SUCCESSFUL BIDDER CANNOT OBTAIN A PERFORMANCE AND PAYMENT BOND IN THE FORM ATTACHED HERETO, ANY PROPOSED MODIFICATIONS SHALL BE APPENDED TO THE BASIC FORM BY MEANS OF RIDERS SETTING FORTH THE MODIFICATIONS.

3. ADDITIONAL INSTRUCTIONS:

SECTION 00200

SUPPLEMENTAL INSTRUCTIONS TO BIDDERS
ROCKWELL INTERNATIONAL CORPORATION

SITE INFORMATION AND CONDITIONS

1. It shall be the CONTRACTOR's obligation to satisfy himself as to the nature, character, quality, and quantity of subsurface conditions likely to be encountered. Any reliance upon the subsurface information made available by the OWNER or the Engineer shall be at the CONTRACTOR's sole risk. The CONTRACTOR agrees that he shall neither have nor assert against the OWNER or Engineer any claim for damages for extra work or otherwise or for relief from any obligation of this Contract based upon the failure by the OWNER or Engineer to obtain or to furnish additional subsurface information or to furnish all subsurface information in the OWNER's or Engineer's possession or based upon any inadequacy or inaccuracy of the information furnished; provided, however that the CONTRACTOR may be entitled to an adjustment in the contract price under the circumstances and to the extent provided in the Specifications.

2. Subsurface information may be made available by the OWNER or Engineer to Bidders, CONTRACTORs, and other interested parties. Neither such information nor the documents on which it may be shown shall be considered a part of the Contract Documents or Contract Drawings, it being understood that such information is made available only as a convenience, without express or implied representation, assurance, or guarantee that it is the true picture of the subsurface conditions to be encountered, or that all pertinent subsurface information in the possession of the OWNER or Engineer has been furnished.

3. CONTRACTOR shall perform the Work required by the contract and any specifications, drawings, or other documents attached to or referred to in the contract, all of which shall be considered a part of the contract. The Work includes furnishing by CONTRACTOR of all materials, equipment, labor, supervision and services necessary for completion of the Work in accordance with the terms of the contract.

4. The Contract documents shall be considered as complementary, and the work or materials called for in one and not mentioned or shown in another shall be of like effect as if called for and shown in each. In the event of a conflict in the contract documents or a discrepancy between them and existing conditions at the

job site, or a discrepancy with applicable laws as provided in Article 5.1, CONTRACTOR shall immediately bring this to the attention of OWNER who shall determine the appropriate course of action. Any work performed by CONTRACTOR prior to OWNER's said determination shall be done at CONTRACTOR's sole risk and expense and CONTRACTOR shall, at its sole expense, make all correction required by OWNER as a result of such work.

5. CONTRACTOR acknowledges that prior to the execution of the contract CONTRACTOR has made any and all examinations and tests that it deems necessary to determining the difficulties and hazards incident to the performance of the Work whether arising from the location of the Work, proximity of other work or adjacent facilities, conditions of the job site, or otherwise, and has determined to CONTRACTOR's satisfaction the nature and extent of all such difficulties and hazards.

6. CONTRACTOR shall make all layouts for the Work from control points established by CONTRACTOR and shall verify and be responsible for the correctness of all measurements.

7. OWNER shall advise CONTRACTOR regarding those utilities and facilities which will be made available at the job site for use by CONTRACTOR and of the conditions regarding such use. All other utilities and facilities required by CONTRACTOR shall be furnished by it at its own expense. CONTRACTOR shall obtain OWNER's approval prior to erection of temporary buildings, storage of materials, and other use of space by CONTRACTOR at job site.

8. The CONTRACTOR shall be responsible for identifying all underground facilities whether they are shown in the contract documents or not. If an underground facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith, identify the Owner of such underground facility and give written notice to Owner and Engineer. Engineer will promptly review the underground facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence of the underground facility. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. During such time, CONTRACTOR shall be responsible for the safety and protection of such underground facility. CONTRACTOR shall be allowed an increase in the Contract

Price or an extension of the schedule, or both, to the extent that they are attributable to the existence of any underground facility that was not shown or indicated in the Contract Documents and that CONTRACTOR did not know of and could not reasonably have been expected to be aware of or to have anticipated. However, OWNER and Engineer shall not be liable to CONTRACTOR for any claims, costs, losses, or damages incurred or sustained by CONTRACTOR on or in connection with any other project or anticipated project.

SCHEDULE OF THE WORK

Time is of the essence on this contract and, therefore, CONTRACTOR agrees to prepare and commence work at the site immediately on September 15, 1994. This will require that the Contractor work conscientiously to prepare the various submittals and plans and obtain the various reviews and approvals essential to allowing the commencement of work on September 15, 1994. Based on information provided, Contractor shall submit with his bid a proposed schedule for completion of the work and a completion date in the Bid Form. The work must be completed by March 1, 1995.

SUBMITTAL SCHEDULE

Submit With Bid

- Information on excavating, hauling, mixing, soil placement, compacting, and grading equipment.
- Description of erosion and sediment control.
- Description of soil processing system including: processing equipment, material handling equipment and methods, containment system, and haul road routes and construction equipment.
- Description of air emission controls and associated equipment.
- Description of soil cell operation, equipment, and materials.
- Description of on-site water collection, storage, and treatment.
- Information on off-site water treatment facility.
- Description of waste handling, storage, and disposal.
- Information on off-site solid waste disposal facility.

Submit Within Three Weeks of Contract Award

- Project Security Control Plan.
- Test reports on earthen materials.
- Location of all aggregate and borrow sources and material "clean" certification.
- All product submittals (e.g., Chain link fence, geomembrane, geotextile, etc.)
- Soil Erosion and Sediment Control Plan and product data.
- Fertilizing and seeding submittals.
- Full-Scale Soil Processing Test Work Plan.
- Full-Scale Soil Processing Work Plan (may need revision later based on full-scale test).
- Soil cell equipment and material submittals.
- Processed soil placement and soil cell operation submittals.
- Work plan for water collection, storage, and on site treatment (off-site treatment and disposal, if appropriate).
- Work plan for waste handling, storage, and disposal.

Interim Submittals and Submittals Required at Completion of Project

All interim and final submittals shall be provided by CONTRACTOR as required by the Project Specifications and shall be submitted to Engineer to allow proper review such that project delays are not incurred.

[END OF SECTION]

SECTION 00300
ROCKWELL INTERNATIONAL CORPORATION
AUTOMOTIVE OPERATIONS

BID FORM

Name and Location of Project:

Date:_____

Invitation-To-Bid No._____
Dated: _____

To: Rockwell International Corporation
Automotive Operations
2135 West Maple Road
Troy, Michigan 48084
Attn:_____

In compliance with your Invitation To Bid referenced above, the undersigned hereby offers to furnish all labor, equipment and materials and perform all work specified therein in strict accordance with the specifications, schedules, drawings, and conditions, including the provisions of the form of contract attached to the Invitation To Bid:

(1) FOR THE PRICE OF $_____

(2) AND, WITHIN _____ CALENDAR DAYS AFTER THE DATE OF EXECUTION OF THE CONTRACT, WHICH, IN ANY EVENT, WILL NOT EXCEED THE NUMBER OF CALENDAR DAYS, IF ANY, SPECIFIED IN THE INVITATION TO BID.

(3) PERFORMANCE BOND $_____

If requested by Rockwell International, the undersigned agrees to promptly execute a contract, in the form attached to the Invitation To Bid, and including the price and delivery schedule set forth herein which will evidence the contract between the parties. In addition, the undersigned shall furnish performance and payment or other bonds, as required, with good and sufficient surety or sureties.

FIRM:_____

BY:_____

TITLE:_____

DATE:_____

PHONE:_____

Bid Form 8-D-53, Rev.3-73

ROCKWELL INTERNATIONAL CORPORATION
SCHEDULE A - COST BREAKDOWN

Name and Location of Project:
Soil Interim Remedial Action
Randall Textron Site
Grenada, Mississippi

Date _____
Invitation to Bid
No. _____
Dated _____

Column 1 + Column 2 = Column 3 = Column 4 + Column 5 + Column 6

Scope of Work		In-House Costs	Subcontractor Costs	Total Costs	Material Costs	Equipment Costs	Labor Costs
1.	Health and Safety						
2.	Submittals						
3.	Mobilization/ Demobilization						
4.	Field Office						
5.	Site Preparation						
6.	Surveying						
7.	Topsoil Removal						
8.	Full-scale Processing Test						
9.	Full-scale Processing[1]						
10.	On-site Water Treatment[2]						
11.	Off-site Water Treatment[2]						
12.	Placement of Treated Soil						
13.	Characterize/Dispose of Screened Material[3]						
14.	Characterize/Dispose of Air Treatment Residue[3]						

SCHEDULE A - COST BREAKDOWN (Continued)

Scope of Work (Con't)		In-House Costs	Subcontractor Costs	Total Costs	Material Costs	Equipment Costs	Labor Costs
15.	Characterize/Dispose of Water Treatment Residue[3]						
16.	Miscellaneous Items[4]						
List:							
Sub-Total							
% Overhead Applied							
% Profit Applied							
Sub-Total							
Perfomance & Payment Bond							
Sales Price Amount		XXXXXXXXX	XXXXXXXXXXXX		XXXXXXXXX	XXXXXXXXX	XXXXXXXXXXXX

SCHEDULE A - COST FOR SOIL CELL TREATMENT (Continued)

Scope of Work (Con't)	In-House Costs	Subcontractor Costs	Total Costs	Material Costs	Equipment Costs	Labor Costs
Soil Cell Treatment for 2,000 cu yd and All Ancillary Items Required[5]						
% Overhead Applied						
% Profit Applied						
Sub-Total						
Perfomance & Payment Bond						
Sales Price Amount	XXXXXXXXX	XXXXXXXXXXXX		XXXXXXXXX	XXXXXXXXX	XXXXXXXXXXXX

Attach separate schedule of competitive bid, i.e., - names of companies and amounts for each item listed under Column 2.

Firm _____
By _____
Title _____
Date _____

FOOTNOTES

[1]Contractor shall state all assumptions for batch time and aggregate mix ratio. Bid to be based on 8,080 cubic yards of soil volume in place to be excavated, of which 7,070 cubic yards is to be processed.
[2]Contractor shall state assumed quantity of water requiring treatment.
[3]Contractor shall state assume volume or quantity for disposal.
[4]List all items not included above but required for completion of the work in the Contract Documents.
[5]Contractor must include all related work items (e.g., Health & Safety Plan, Submittals, Site Preparation, Water Treatment, etc.) in Price given for Soil Cell Treatment. Contractor must state all assumptions. Cost for soil cell treatment not included in Lump Sum Bid.

ROCKWELL INTERNATIONAL CORPORATION
SOIL INTERIM REMEDIAL ACTION
RANDALL TEXTRON SITE
GRENADA, MISSISSIPPI

SCHEDULE B - UNIT PRICES

The Unit Prices quoted herein shall only be used to adjust the contract price for increase or decrease in the scope of work as specified in Bid Form. The Unit prices shall be firm for the duration of this contract and are subject to the same terms and conditions of the original contract.

	Description[1]	Unit of Measure	Unit Price[1] Words	Unit Price[1] Figures ($)
1.	Top Soil Removal	S.F.		
2.	Full-Scale Processing at:			
	A. 2 Minute Batch Time[2]	C.Y.		
	B. 4 Minute Batch Time[2]	C.Y.		
	C. 6 Minute Batch Time[2]	C.Y.		
	D. 8 Minute Batch Time[2]	C.Y.		
	E. 10 Minute Batch Time[2]	C.Y.		
3.	On-Site Water Treatment	1000 gal		
4.	Off-Site Water Treatment and Disposal	1000 gal		
5.	Soil Cell Treatment (Total volume treated during project)	1-500 C.Y.		
		More than 500 C.Y.		

SCHEDULE B - UNIT PRICES (Continued)

The Unit Prices quoted herein shall only be used to adjust the contract price for increase or decrease in the scope of work. The Unit prices shall be firm for the duration of this contract and are subject to the same terms and conditions of the original contract.

	Description	Unit of Measure	Unit Price	
			Words	Figures ($)
6.	Characterize/Disposal of Air Treatment Residue	C.Y.		
7.	Characterize/Disposal of Water Treatment Residue	C.Y.		
8.	Characterize/Disposal of Screened Material	C.Y.		
9.	Aggregate to mix with soil[3]			
	A. Premixed aggregate	C.Y.		
	B. Sand	C.Y.		
	C. Gravel	C.Y.		
10.	Place Treated Soil	C.Y.		

1. All costs are inclusive of all materials, installation, equipment, labor, or the items necessary for a complete installation.
2. Batch time unit prices shall be used to adjust Lump Sum Price if Full-Scale Processing batch time implemented is different then batch time stated by Contractor in Lump Sum Bid.
3. Aggregate unit prices shall be used to adjust Lump Sum Bid if aggregate ratio stated by Contractor in Lump Sum Bid is different than aggregate ratio implemented.

SECTION 00600

PERFORMANCE AND PAYMENT BOND

PRINCIPAL _____

SURETY _____

DATE BOND EXECUTED _____ CONTRACT NO. _____ CONTRACT DATE _____

WHEREAS, the Principal has by written agreement entered into a certain Contract with Rockwell International Corporation, numbered and dated as shown above, which Contract is by reference made a part hereof and is hereinafter referred to as the Contract;

NOW THEREFORE, the Principal and the Surety are held and firmly bound in the total of the amounts as set forth below, for the payment whereof in the manner as specified in Sections 1 and 2 following, the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SECTION 1

To Rockwell International Corporation, in the sum of _____ _____ DOLLARS ($_____), and the condition of this obligation is such that if the Principal shall, well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said Contract during the original term of said Contract and any extensions thereof, with or without notice to the Surety, and during the life of any guaranty or indemnity required under the Contract, and including any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, and if the Principal shall pay to the Government the full amount of the taxes imposed by the Government which are collected, deducted, or withheld from wages paid by the Principal in carrying out the construction contract with respect to which this bond is furnished, then this obligation shall be null and void; otherwise to remain in full force and effect.

SECTION 2

To all persons performing the labor upon or furnishing materials to be used in or furnishing appliances, teams or power contributing to the work described in the Contract, including any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, in the sum of _____ _____ DOLLARS ($_____), and the condition of this obligation is such that if the Principal shall pay or cause to be paid in full the claims of such persons then this obligation shall be null and void; otherwise it shall remain in full force and effect.

To the extent that the work under the Contract is performed in California, this bond is executed for the purpose of complying with Section 3235 of the Civil Code of the State of California, and this bond up to the amount set forth above in this section 2 shall inure to the benefit of the persons described in the preceding paragraph so as to give such persons a right of action to recover upon bond in any suit brought to foreclose the liens provided for by the laws of the State of California or in a separate suit brought upon this bond.

The Principal and Surety further agree to pay all just claims of laborers arising under said Contract, within two (2) weeks after demand and to waive the filing of lien claims or giving written notice required by statute as a condition to bringing suit to enforce the same.

INDIVIDUAL PRINCIPAL(S)	CORPORATE PRINCIPAL	SURETY
1. SIGNATURE _____	_____	_____
NAME _____	BUSINESS ADDRESS	BUSINESS ADDRESS
ADDRESS _____	_____	_____ AFFIX CORPORATE SEAL
	BY _____	BY _____
2. SIGNATURE _____	TITLE _____	TITLE _____
NAME _____	WITNESSED BY _____ AFFIX CORPORATE SEAL	WITNESSED BY _____
ADDRESS _____		
WITNESSED BY _____		

AGREEMENT TO BOND

We, the undersigned, hereby agree to become bound as Surety for

_____

_____ in bonds each totalling One Hundred Per Cent (100%) of the contract amount, and conforming to the Instruments of Contract attached hereto, for the full and due performance of the works shown as described herein and for the payment of all labor and materials, if the Bid for

_____

_____

_____ is accepted by Rockwell.

It is a condition of this Agreement that if the above mentioned Bid is accepted, application for a Performance Bond and a labor and Material Payment Bond must be completed with the undersigned within Fifteen (15) calendar days of acceptance of the bid related thereto, otherwise this Agreement shall be null and void.

Dated this _____ day of _____, 199_.

_____
Name of Bonding Company

_____
Signature of Authorized
Person Signing for Company

_____
Position

AGREEMENT NO. _____

HAZARDOUS WASTE REMEDIATION SERVICES AGREEMENT

This Agreement is entered into this __TH day of ___, 1994, between Rockwell International Corporation, a Delaware Corporation ("Rockwell"), acting through its _____ Division and _____ ("Contractor").

Rockwell and Contractor hereby agree that Contractor shall perform waste services for the Division's facility at _____ ("Plant") on the following terms and conditions:

1. As used in this Agreement:

"Conforming Waste Material" means waste material from the Plant conforming to the description on Exhibit A hereto.

"Waste Material" means Conforming Waste Material.

"Waste Services" means some or all of the following waste services, as specified in Paragraph 2 hereof, to be performed or supplied by Contractor to Rockwell: processing or recycling of Waste Material including the labor, materials and equipment necessary and incidental thereto.

2. Performance of Waste Services: Contractor shall perform the Waste Services as set forth in Exhibit A for Conforming Waste Material from the Plant. Processing of Conforming Waste Material shall be only in manner permitted by law and only at the processing site located at Buyer's site. Contractor shall perform the Waste Services in a careful and workmanlike manner and shall take all necessary and appropriate precautions in providing Waste Services to avoid injury to any person, damage to any property or contamination of the environment.

3. Term of Agreement: The Term of this Agreement shall be ___ months commencing on _____ and ending on _____. Either party may terminate this Agreement at any time during the Term of this Agreement by thirty (30) days prior written notice to the other party.

4. Payment: Rockwell shall pay Contractor the Waste Services charge designated in Exhibit B for Conforming Waste Material removed, transported, and disposed of by Contractor in accordance with the terms and conditions of this Agreement. Payment terms shall be as set forth in Exhibit B.

5. Compliance with Laws and Regulations: Contractor and Rockwell shall comply with all requirements of federal, state and local laws, rules, regulations and ordinances applicable to the Waste Services performed under this Agreement. Contractor and Rockwell shall comply with all reasonable rules and regulations including safety standards, adopted by Rockwell and Contractor for observance at Rockwell's and Contractor's facilities.

6. Permits: Contractor shall obtain and furnish Rockwell with copies of all permits and other documents which are required under federal, state and local laws, rules, regulations and ordinances for the Waste Services to be performed under this Agreement.

7. Independent Contractor: At all times herein, Contractor shall be considered an independent contractor. Contractor shall conduct itself consistent with such status and neither hold itself out as nor claim to be an employee or agent of Rockwell by reason of this Agreement.

8. Contractor's Indemnity: Contractor shall indemnify, defend and hold harmless Rockwell, its directors, officers, and employees from and against any and all liabilities, losses, damages, claims, penalties, forfeitures, suits and costs and expenses of every character whatsoever incident thereto (including court costs, costs and expenses of defense, settlement, and reasonable attorney's fees) which it or they may hereafter incur, become responsible for or pay out as a result of death or bodily injuries to any person (including employees of Contractor and employees of Rockwell), destruction or damage to any property, or adverse effects on the environment or any violation of governmental laws, regulations or orders, caused, in whole or in part, by, resulting from, arising out of, incidental to, or in any manner whatsoever connected with the performance of the work by Contractor under this Agreement, except those claims, liabilities, losses, damages, and expenses occasioned by the sole and active negligence of Rockwell.

9. Rockwell's Indemnity: Rockwell shall indemnify, defend and hold harmless Contractor, its directors, officers and employees from and against any and all liabilities, losses, damages, claims, penalties, forfeitures, suits and costs and expenses of every character whatsoever incident thereto (including court costs, costs and expenses of defense, settlement, and reasonable attorney's fees) which it or they may hereafter incur, become responsible for or pay out as a result of death or bodily injuries to any person (including employees of Contractor and employees of Rockwell), destruction or damage to any property, or adverse effects on the environment or any violation of governmental laws, regulations or orders, caused, in whole or in part, by, resulting from, arising out of, incidental to, or in any manner whatsoever connected with (i) Rockwell's breach of any terms or provision of this Agreement; or (ii) any negligent or willful act or omission of Rockwell or its employees in the performance of this Agreement; or (iii) the delivery to Contractor by Rockwell of Non-Conforming Waste Material.

10. Insurance: Contractor shall carry, at its expense, the following insurance coverage.

COVERAGE LIMITS	
Worker's Compensation	Statutory
Employer's Liability	$500,000 each occurrence

11. Access to Records: Contractor shall permit, at all reasonable times, duly authorized representative of Rockwell to inspect and have access to the books, records and documents pertaining to the performance of Waste Services for the purpose of auditing and verifying the performance of Waste Services, the charges for such Waste Services, and the maintenance of records related to such Waste Services. Such access by Rockwell's representative shall include the right to discuss such documentation with Contractor's personnel having knowledge of their contents and the right to copy such documentation. Contractor shall preserve all documentation pertaining to Waste Services for a period of three (3) years following completion of Waste Services rendered by Contractor to Rockwell.

12. a. Confidentiality: Contractor and Rockwell agree to hold mutually confidential all data on material and information regarding processing, records, recycling, policies, procedures, methods, and technology plans or programs obtained from the other except that such data may be provided to subcontractor or customers of the recycle powder who resonably require such information in order to perform work under the agreement.

13. Non-exclusivity: This Agreement is not a requirements contract. Neither Rockwell nor Contractor is obligated to contract exclusively with the other for Waste Services at the Plant or elsewhere.

14. Excuse of Performance: The performance of this Agreement, except for the payment by Rockwell of money for Waste Services already rendered to it by Contractor, may be suspended by either party in the event the delivery of Waste Materials by Rockwell or removal, transportation or disposal of such Waste Materials by Contractor is prevented by a cause or causes beyond the reasonable control of such party. Such causes shall include, but not be limited to, acts of God, act of war, riot, fire, explosion, accident, flood, or sabotage, lack of adequate fuel, power, raw materials, labor or transportation facilities, governmental laws, regulations, requirements, orders, or actions, breakage or failure of machinery or apparatus, national defense requirements, injunctions or restraining orders, labor trouble, strike, lockout or injunction (providing neither party shall be required to settle a labor dispute against its own best judgement).

15. Waiver: Waiver by Rockwell of any default by Contractor shall not be construed as a general waiver, but as a specific waiver applying only to the default waived, and shall not preclude Rockwell from any rights or remedies in respect of any default theretofore occurring which has not been waived or any default occurring thereafter.

16. Notice: Any notice or order provided for in this Agreement shall be deemed to have been given (i) to Rockwell if mailed to Rockwell International Corporation, or (ii) to Contractor if mailed to _____.

17. Law to Apply: The validity, interpretation and performance of this Agreement shall be governed and construed in accordance with the laws of the state of Michigan.

18. Assignment: Neither party may assign any rights or obligations under this Agreement without the express written consent of the other party. Such consent, however, shall not be unreasonably withheld.

19. Severability: If any paragraph, subparagraph, sentence or clause of this Agreement shall be adjudged illegal, invalid or unenforceable, such illegality, invalidity or unenforceability shall not affect the legality, validity or enforceability of the Agreement as a whole or of any paragraph, subparagraph, sentence or clause hereof not so adjudged.

20. Paragraph Headings: The paragraph headings used herein are for reference and convenience only and shall not enter into the interpretation hereof.

21. Entire Agreement: This Agreement represents the entire understanding and agreement between the parties hereto relating to the transportation, storage, treatment, processing and disposal of Waste Material and supersedes any and all prior Agreements that may exist between the parties regarding same and supersedes any and all terms and conditions which may be contained in any purchase orders, issued by Rockwell and in any order acknowledgment form issued by Contractor prior to or subsequent to this Agreement.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized representatives as of the da and year above written.

CONTRACTOR

By_____

Title _____

ROCKWELL INTERNATIONAL CORPORATION

By_____

Title _____

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

A. These Project Specifications, including the Drawings, describe the labor, materials, equipment, transportation, testing, supervision, and other incidentals necessary to implement a soil interim remedial action at the Randall Textron Facility, Highway 332 East, Grenada, Mississippi. The soil remedial action includes, but is not limited to, soil excavation, soil stockpiling, soil mixing, replacement of treated soil into the original excavation, and site restoration. Cell construction for further soil treatment may also be required, depending on the results of Phase 1 Full-Scale Testing. The Contractor shall be responsible for implementing the project, complete in all aspects necessary to perform the work, whether or not noted in the Specifications or shown in the Drawings.

B. This soil interim remedial action will be conducted in two phases. Phase 1 generally is intended to consist of full-scale on site blending (processing) of contaminated material with aggregate to evaluate the effectiveness of mixing on trichloroethene (TCE) reduction and assist with selection of the feed material/aggregate ratio. Phase 2 consists of full scale processing and soil cell treatment, as necessary. The major tasks of these two work phases are described below.

1. Phase 1 - Full-Scale Soil Processing Test

   a. Preparation of "Contractor Full-Scale Soil Processing Test Work Plan"

   b. Development and implementation of a project Health and Safety Plan (HASP), including contingency plan and a decontamination plan.

   c. Site preparation including set-up of field office; haul road construction; fence removal; security fence and gate installation; installation of surface water drainage features; and installation of dust and erosion control measures.

d. Construction of containment system for soil mixing area, soil stockpiles, and water storage and treatment area to protect the underlying and adjacent environment from contamination.

e. Use of a certified surveyor.

f. Stormwater management to collect and convey stormwater away from contaminated areas and provide erosion control.

g. Water collection, storage, and treatment as necessary.

h. Excavation, hauling, processing, and stockpiling soil in accordance with Final Contractor Full-Scale Soil Test Processing Work Plan.

i. Coordination with Engineer to facilitate sampling and other data collection needs.

j. Provision of all other services and accomplishment of all other requirements as specified within the specifications for completion of this phase of the project.

2. Phase 2 - Full-Scale Soil Processing

a. Excavation, hauling, processing, and stockpiling soil in accordance with Final Full-Scale Soil Processing Work Plan using the batch time and aggregate blend ratio determined from Phase 1.

b. Updating, as necessary, the project Health and Safety Plan (HASP).

c. Construction of containment system to protect the underlying and adjacent environment from contamination where contaminated soils, processed soils, soil stockpiles, soil cell, and other potentially contaminated material are placed on uncontaminated soil.

d. Stormwater management to collect and convey stormwater away from contaminated areas and erosion control.

e. Water collection, storage, and treatment as necessary.

f. Hauling, backfilling, compacting, and grading for placement of treated soil into original excavation.

g. Testing and removing of processed soil stockpile, soil cell, and mixing area base and accessory items.

h. Analyzing and properly disposing of debris screened or removed from the excavated soil as necessary for legal off site disposal.

i. Restoration of the ball field to original conditions, removal of security fence, and replacement of other fences removed for this work.

j. Provision of all other services and accomplishment of all other requirements as specified within the specifications and for a complete installation and project.

1.02 CONTRACTS

A. The work shall be performed under one General Contract.

1.03 WORK SEQUENCE

A. Work shall first commence with Phase 1 - Full-Scale Processing Test followed by Phase 2 - Full Scale Treatment, upon satisfactory completion of Phase 1, as determined by the Engineer.

B. Work sequence shall be conducted in a manner that will minimize the potential for contamination of areas not contaminated or recontamination of any area addressed by this interim action.

C. Work shall be conducted such that areas beyond the "Limits of Work" shown on the Drawings or the property boundaries are not contaminated or disturbed.

D. Work shall be scheduled so that it does not interfere with operation of Randall Textron's wastewater treatment facility.

1.04 CONTRACTOR'S USE OF PREMISES

A. Contractor's use of the premises shall be confined to the "Project Limits of Work" shown on the Drawings. Under no circumstances shall Contractor

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Bid Price (Lump Sum) Items

B. Unit Price Items

1.02 RELATED SECTIONS

A. Section 00300 - Bid Forms

B. Applicable Technical Sections

1.03 GENERAL DESCRIPTION (For Bid Price and Unit Price Work)

A. These items are the same pay items listed in the Bid Form. They constitute all of the pay items for completion of the Work. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, services, field offices, layout surveys, sanitary requirements, testing, meetings, safety devices, approval and record drawings, water supplies, power, heat, maintaining traffic, removal of waste, watchmen, taxes, bonds, insurance, mobilization and demobilization, environmental protection, restoration, or any other ancillary items necessary for the proper completion of the Work. Compensation for all services, accessory work, and materials shall be included in the prices stipulated for the lump sum and Unit Price pay items listed herein.

1.04 ENGINEER'S ESTIMATE OF QUANTITIES (For Unit Price Items)

A. Engineer's estimated quantities for Unit Price items, as listed in the Bid Forms, are for reference only and are included solely for the purpose of comparison of Bids. Additionally, they include only quantities different (higher or lower) than that which are specified under the Bid Price (lump sum) items. Owner does not expressly or by implication agree that the nature of the materials encountered or the actual quantities of material to be removed or required will correspond therewith, and reserves the right to increase or decrease any

quantity or to eliminate any quantity as Owner may deem necessary.

1.05 BID PRICE

A. Contractor shall furnish all materials, labor, equipment, and incidental services to fully complete the Work. Work also includes all accessories, appurtenances, or other work required for the completion of Work, except those items specifically included under other Measurement for Payment sections of the Contract.

B. The Bid Price Work shall be a lump sum. Breakdown of the lump sum bid shall be provided as shown on the Bid Form.

1.06 UNIT PRICE

A. Contractor shall furnish all materials, construct, and fully complete Work of Unit Price items in the quantities (if any) encountered in the Work. The Unit Price Work shall apply only to addition or deletion of work items shown on the drawings or specified herein as directed by Owner or Engineer. Estimated quantities are included solely for the purpose of Bid comparison.

[END OF SECTION]

SECTION 01050

FIELD ENGINEERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Field measurement and control work necessary to perform the elements of the Project as shown on the Drawings, and specified.

B. The Contractor shall retain a licensed Surveyor who shall be responsible for all surveying associated with the Work as specified in Section 01400 - Construction Quality Control.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work

B. Section 01400 - Construction Quality Control

C. Section 01600 - Protection of Work and Property

1.03 SUBMITTALS

A. The Contractor shall submit the name and the qualifications of the surveyor, licensed in the State of Mississippi, that will perform survey work.

1.04 LIMITS OF WORK

A. The areas shown on the Drawings may be approximate and are not necessarily drawn to scale. Boundaries of limits were based on existing data, survey and topographic information. The specific Contractor Project Limits of Work are shown on the Drawings.

B. Contractor shall consider the Drawings as approximate and shall maintain a marked up drawing indicating dimensions of the actual work areas. However, this shall not relieve the Contractor of complying with controlling dimensions and maintaining the intent and extent of the work shown on the Drawings.

C. Contractor's surveyor shall make all measurements and check all dimensions necessary for the proper execution of the Work called for by the Drawings and Project Specifications.

E. Contractor shall furnish in writing to the Engineer for interpretation any apparent discrepancy found

which would result in an increase or decrease in the amount of work prior to conducting the Work. Payment will be based on the appropriate unit price.

1.05 SURVEYS AND PROJECT LAYOUT

A. The Contractor's surveyor shall use the baseline and coordinates shown on the drawings and verify existing benchmarks that are to be used. The Contractor's surveyor shall develop and make detailed surveys needed for construction and excavated soil volume, including a construction baseline grade and staking.

B. The Contractor shall hire an independent registered surveyor, licensed in the State of Mississippi who shall conduct all survey work and prepare and seal the marked-up as-built drawings and volume determination of the excavated soil. The surveyor shall be hired and paid for by the Contractor.

C. The Contractor shall set and maintain all necessary intermediate points, lines, grades, and elevations and provide slope stakes, offset stakes, and other such items.

D. The accuracy of the Contractor's survey and other required data is the sole responsibility of the Contractor and the furnishing of the data to the Owner does not constitute a transferal of responsibility. A before and after contour map of the excavation for determination of the volume of excavated soil shall be submitted to the Engineer.

E. The excavation shall be laid out using grade stakes or off set stakes at a maximum of fifty (50) foot intervals. A baseline shall be established for each excavation as shown on the Drawings. In addition, survey shall be adequate to reflect grade changes between grid points established for the minimum survey grid.

F. The Contractor shall protect and safeguard all points, stakes, grade marks, monuments, and bench marks at the site of the Work, and shall re-establish, at his expense, any marks which are removed or destroyed due to his construction operations. The Contractor shall bear the entire expense of rectifying work improperly installed due to not maintaining or protecting marks, or to removing, without the Owner's written approval, any such established points, stakes, or marks.

[END OF SECTION]

SECTION 01060

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance of all on-site and off-site work in accordance with all applicable local, state, and federal laws and regulations.

1.02 RELATED SECTIONS

A. Section 01160 - Health and Safety Plan

B. Section 01400 - Construction Quality Control

C. Section 02931 - Dust, Erosion, and Sediment Control

D. Section 13400 - Water Storage, Treatment, and Disposal

1.03 SUBMITTALS

A. Submit to Engineer a plan to satisfy all compliance needs of environmental protection plans. Plan shall at a minimum identify each permit required to conduct the project, the regulatory agency with authority for each permit, a schedule for acquiring permits, and a description of the requirement for each approval.

1.04 ON-SITE ACTIVITIES

A. On-site work must comply with the following environmental laws, rules, and regulations.

1. Safe Drinking Water Act: 42 U.S.C. 300f et seq. Site remediation activities must not result in groundwater contamination or surface water contamination.

2. Federal Water Pollution Control Act (Clean Water Act): 33 U.S.C. 1251 et seq.

3. National Pollutant Discharge Elimination System Permit Regulations: 40 CFR 22; State of Mississippi Water Pollution Control, Stormwater Construction General Permit Requirements.

4. Mississippi Water Quality Criteria for Intrastate and Coastal Waters

5. Clean Air Act: 42 U.S.C. 7401 et seq.

6. State of Mississippi, Air Emission Regulations for the Prevention, Abatement, and Control of Air Contaminants: Regulation APC-S-1.

7. State of Mississippi, Permit Regulations for the Construction and/or Operation of Air Emissions Equipment: Regulation APC-S-2.

8. National Emission Standards for Hazardous Air Pollutants, 40 CFR Part 61.

9. National Emission Standards for Hazardous Air Pollutants for source categories, 40 CFR Part 61.

10. Resource Conservation and Recovery Act (RCRA): 42 U.S.C. 6901 et seq.

11. Occupational Safety and Health Administration (OSHA): 29 CFR 1910 and 1926.

12. Any other applicable federal, state, or local rules or regulations.

13. Mississippi Department of Environmental Quality, Office of Pollution Control: Hazardous Waste Management Regulations.

14. EPA General Regulations for Hazardous Waste Management (40 CFR 260).

15. EPA Regulations for Identifying Hazardous Waste (40 CFR 261).

16. EPA Regulations of Hazardous Waste Generators (40 CFR 262).

17. EPA Regulations for Hazardous Waste Transporters (40 CFR 263).

18. EPA Regulations for Owners and Operators of Permitted Hazardous Waste Facilities (40 CFR 264).

19. EPA Interim Status Standards for Owners and Operators of Hazardous Waste Facilities (40 CFR 265).

20. EPA Standards for Management of Specific Hazardous Wastes and Facilities (40 CFR 266).

21. EPA Interim Standards for Owners and Operators of New Hazardous Waste Land Disposal Facilities (40 CFR 267).

22. EPA Regulations on Land Disposal Restrictions (40 CFR 268).

23. EPA Regulations for Federally Administered Hazardous Waste Permit Programs (40 CFR 270).

1.05 OFF-SITE ACTIVITIES

A. Hazardous Materials

1. Hazardous Waste Regulations: 40 CFR 260 through 270 and Mississippi Hazardous Waste Management Regulations for any material to be evaluated or disposed of off site as a characteristic hazardous waste.

B. Non-Hazardous Materials

1. State of Mississippi or local solid waste regulations.

C. Transportation

1. Transportation of any raw or waste materials must comply with all applicable regulations including, but not necessarily limited to, the following:

a. Department of Transportation: 49 CFR 171-179.

b. USEPA: 40 CFR 263 for any hazardous materials disposed of off site.

D. Any other applicable federal, state, or local rules or regulations.

1.06 PERMITS, LAWS, AND REGULATIONS

The Contractor shall obtain all necessary permits from the County, State, municipal, or other public authorities; shall give all notices required by the law or municipal ordinances; and shall pay all fees and charges incidental to the due and lawful execution of the Work done under this Contract. Notice of spills and/or releases of petroleum or petroleum products, hazardous substances, or wastes

of any type shall be made immediately by the Contractor to the Owner and to the proper regulatory agency.

Contractor shall keep himself fully informed of all laws, ordinances, regulations, and applicable codes affecting those engaged or employed in the Work, or the materials used in the Work, or affecting the conduct of the Work, and of all orders, decrees, and instructions of bodies or tribunals having jurisdiction or authority over the same. If any discrepancy or inconsistency should be discovered in the Contract Documents in relation to any such law, ordinance, regulation, code, order, decree, or instruction, he shall forthwith report the same in writing to the Owner.

Contractor shall at all times observe and comply with and shall cause all his agents, subcontractors, and employees to observe and comply with all such existing and future laws, ordinances, regulations, codes, orders, decrees, and instructions.

[END OF SECTION]

SECTION 01090

REFERENCES AND DEFINITIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reference Standards and Abbreviations

B. Definitions

1.02 RELATED SECTIONS

A. Applicable Technical Specification.

1.03 REFERENCE STANDARDS AND ABBREVIATIONS

A. American Society for Testing and Materials (ASTM)

B. Occupational Safety and Health Act (Current Standards) (OSHA)

C. National Sanitation Foundation (NSF) Standard 54, "Flexible Membrane Liners," revised May 1991.

D. Code of Federal Regulations (CFR)

1.04 DEFINITIONS

A. Addenda: Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Documents or the Contract Documents.

B. Bid: The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices and the Work to be performed.

C. Bidder: One who submits a Bid directly to Owner, as distinct from a sub-bidder, who submits a bid to Bidder.

D. Bidding Documents: Includes the Invitation to Bid, Instructions to Bidders, the Bid Form, and the "Contract Documents" (including all Addenda issued prior to receipt of Bids).

E. Bonds: Bid, performance and payment bonds and other instruments of security.

F. Change Order: A document recommended by Owner's Representative, which is signed by Contractor and Owner authorizing an addition, deletion, or

revision in the Work, or an adjustment in the contract price or the contract time, issued on or after the Effective Date of the Contract.

G. Contract: The written agreement between Owner and Contractor covering the Work to be performed; other Contract Documents are attached to the Contract and made a part thereof as provided therein.

H. Contract Documents: The documents so identified in the Contract.

I. Contract Drawings: The drawings which show the character and scope of the Work to be performed and which are referenced in the Contract Documents.

J. Contractor: The person, firm or corporation with whom Owner has entered into the Contract.

K. Design Engineer: The person, firm, or corporation that prepared the Drawings and Specifications.

L. Effective Date of the Contract: The date indicated in the Contract on which it becomes effective, but if no such date is indicated it means the date on which the Contract is signed and delivered by the last of the two parties to sign and deliver.

M. Engineer: The Owner or Owner designated representative retained to conduct observation on behalf of the Owner.

N. Laws and Regulations; Laws or Regulations: Laws, rules, regulations, ordinances, codes, and/or orders of any governmental entity having jurisdiction over the Work which apply to the Work.

O. Notice of Award: The written notice by Owner to the apparent successful Bidder stating that upon compliance by the apparent successful Bidder with the conditions precedent enumerated therein, within the time specified, Owner will sign and deliver the Agreement.

P. Notice to Proceed: A written notice given by Owner to Contractor fixing the date on which the contract time will commence to run and on which Contractor shall start to perform Contractor's obligations under the Contract Documents.

Q. Owner: The corporation, association, firm, or persons with whom Contractor has entered into the Contract and for whom the Work is to be provided.

R. Project: The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

S. Schedule of Values: Contractor's itemized listing of activities of the Work, setting forth in a form acceptable to Owner, Contractor's allocation of the contract price by activity. The same activities shall be incorporated into Contractor's progress schedule.

T. Shop Drawings: All drawings, diagrams, illustrations, schedules, and other data which are specifically prepared by or for Contractor to illustrate some portion of the Work; and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by Contractor to illustrate materials or equipment for some portion of the Work.

U. Specifications: Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

V. Sub Contractor: An individual, firm, or corporation having a direct contract with Contractor or with any other Sub Contractor for the performance of a part of the Work at the site.

W. Successful Bidder: In the event Owner makes an award, means the Bidder to whom Owner (on the basis of Owner's evaluation) awards a Contract.

X. Supplier: A manufacturer, fabricator, distributor, materialman, or vendor.

Y. Surveyor: An independent surveyor hired and paid for by Contractor licensed in the State of Mississippi who shall perform survey work associated with the Work.

Z. Target Concentration Limit: 7.8 mg/kg of trichloroethene (TCE) in soil as measured using EPA SW-846 Method 8010 or 8240 and corrected to account for soil amendment.

AA. Treated Soil: Soil that meets the target concentration limit after being processed or after ex-situ vapor extraction treatment in a soil cell.

BB. Underground Structures: All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasement containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control system or water.

CC. Unit Price Work: Work to be paid for on the basis of unit prices as shown on Contractor's Schedule of Values.

DD. Unit Price: The price of a unit of Work as shown in Contractor's Schedule of Values.

EE. Work: The entire completed construction or the various separately identifiable parts therefore required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor, and furnishing and incorporating materials and equipment into the Construction, all as required by the Contract Documents.

FF. Work Plan: A Plan written by the Contractor to detail the procedure and equipment planned for the completion of the work.

GG. Work Directive Change: A written directive to Contractor, issued on or after the Effective Date of the Contract and signed by Owner and recommended by Owner's Representative, ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed or to emergencies. A Work Directive Change may not change the contract price or the contract time, but is evidence that the parties expect that the change directed or documented by a Work Directive Change will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the contract price or contract time.

HH. Written Amendment: A written amendment of the Contract Documents, signed by Owner and Contractor on or after the Effective Date of the Contract and normally dealing with the nonengineering or nontechnical rather than strictly work-related aspects of the Contract Documents.

[END OF SECTION]

SECTION 01160

HEALTH AND SAFETY PLAN (HASP)

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Health and Safety Plan

B. Personnel Requirements

C. Task/Operation Safety and Health Risk Analysis

D. Personnel Training Requirements

E. Personal Protective Equipment

F. Medical Surveillance Requirements

G. Air Monitoring and Personnel Air Sampling

H. Site Control Measures

I. Decontamination Plan

J. Emergency Response/Contingency Plan

K. Spill Containment Program

L. Additional Requirements

1. The objective of these procedures is to minimize the risk of exposure to hazardous substances by identifying, evaluating, and controlling potential safety and health hazards. Contractor shall be responsible for preparing and implementing the HASP. This HASP shall apply to all personnel on site during construction including but not limited to the Contractor's employees and subcontractor's employees, Engineer, and Owner.

2. Contractor must also familiarize himself and Contractor's employees and subcontractor's employees with Owner's site-specific Health and Safety plans and procedures.

1.02 RELATED SECTIONS

A. Section 01060 - Regulatory Requirements

B. Section 01340 - Submittals, Shop Drawings, Product Data, and Samples

1.03 REFERENCES AND STANDARDS

A. Federal OSHA Standards

1. *Air Contaminants - Permissible Exposure Limits*; OSHA 3112; 1989.

2. *General Industry Standards and Interpretations*; Volumes 1 - 3- OSHA 2077; U.S. Department of Labor, Occupational Safety and Health Administration; Specifically Sections: 29 CFR 1910.1000-1050 (air contaminants), 1910.120 (Hazardous Waste Operations and Emergency Response), 1910.1200 (Hazard Communication), 1910.301 Subpart S (Electrical), 1910.146 (Permit Required Confined Space) 1910.147 (Control of Hazardous Energy (Lockout/Tagout), 1904 (Recordkeeping and Reporting Occupational Injuries and Illnesses), 1990 (Identification, Classification and Regulation of Potential Occupational Carcinogens), and 1926 (Safety and Health Regulations for Construction).

3. *Hazardous Waste Inspections Reference Manual*; U.S. Department of Labor; Occupational Safety and Health Administration; 1986.

4. *OSHA Field Operations Manual*; 2nd Edition; U.S. Department of Labor; Occupational Safety and Health Administration; 1987.

B. Other References and Standards.

1. *A Guide to the Safe Handling of Hazardous Materials Accidents*; STP 825; American Society for Testing and Materials; 1983.

2. *Air Sampling Instruments*; 6th Edition; American Conference of Governmental Industrial Hygienists (ACGIH); 1983.

3. *Air Surveillance for Hazardous Materials*; USEPA Office of Emergency and Remedial Response, Hazardous Response Support Division; 1985.

4. *Casarett and Doull's Toxicology -- The Basic Science of Poisons*; 3rd Edition; Klaassen, CD, Amdur, MO, Doull, J; MacMillan; 1986.

5. *Dangerous Properties of Industrial Materials*; Sax, NI; Van Nostrand Reinhold Cn.; New York; 1988.

6. *Detector Tube Handbook*, 7th Edition; Dragerwerk AG Lubeck (National Draeger); 1989.

7. *Fire Service Emergency Management Handbook*; Federal Emergency Management Agency; 1985.

8. *Fire Protection Guide on Hazardous Materials*; 8th Edition; National Fire Protection Association; 1986,

9. *Fundamentals of Industrial Hygiene*, 3rd Edition; Plog, BA; National Safety Council; 1988.

10. *Guide to Industrial Respiratory Protection*; NIOSH Publication 87-116; US Department of Health and Human Services, Public Health Service, Centers for Disease Control, NIOSH; 1987.

11. *Guide to Portable Instruments for Assessing Airborne Pollutants Arising from Hazardous Wastes*; (draft international document); International Organization of Legal Metrology; 1988.

12. *Guidelines for the Selection of Personal Protective Equipment*; 3rd Edition; Schwope, A.D.; American Conference of Governmental Industrial Hygienists; Cincinnati; 1987.

13. *Handbook of Reactive Chemical Hazards*; 3rd Edition; Bretherick, L.; Butterworths, London; 1985.

14. *Hazardous Materials: Practical Tactical Considerations for Emergency Response Personnel* (seminar proceedings); Institute for Life Safety Technology and Emergency Management Education; International Society of Fire Service Instructors.

15. *Hazardous Waste Handbook for Health and Safety*; Martin, W.F.; Lippit, J.M.;. Prothero, T.C.; Butterworth Publishers; 1987.

16. *Hazardous Materials Emergencies Response and Control*; Cashmon, J.R.; Technomic Publishing Company; 1983.

17. *Hazardous Materials*; Isman, W.E., Carlson, G.P.; MacMillan; 1980.

18. *Hazardous Materials for First Responders*; First Edition; International Fire Service Training Association, Oklahoma State University; 1988.

19. *Health and Safety Audit Guidelines - SARA Title I Section 126*; USEPA Office of Emergency and Remedial Response, EPA 540/G-89/010; December 1989.

20. *ILO Encyclopedia of Occupational Health and Safety*; Volumes 1 and 2; International Labor Organization; 1983.

21. *Industrial Hygiene -- A Guide to Technical Information Sources*; Tucker, M.E.; American Industrial Hygiene Association; 1984.

22. *NIOSH Manual of Analytical Methods*; 3rd Edition; DHHS (NIOSH) Publication No. 84-100, Eller, P. M., Ph.D., CIH, Editor; February 1984.

23. *NIOSH/OSHA Pocket Guide to Chemical Hazards*; U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, NIOSH; 1990.

24. *Occupational Health Guidelines for Chemical Hazards*; NIOSH/OSHA Department of Health and Human Services (NIOSH) Publication No. 81-113; January 1981.

25. *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*; NIOSH/OSHA/USCG/EPA; U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, NIOSH; 1985.

26. *Patty's Industrial Hygiene and Toxicology*; Volumes I through 3B. Clayton, F. E. et al; John Wiley and Sons, Inc.; 1978.

27. *Performance of Protective Clothing*; Barker, R.L., Colletta, G.C.; American Society for Testing and Materials; 1986.

28. *Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide*; NIOSH Publication 84-114; U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, NIOSH; 1984.

29. *Practical Guide to Respirator Use in Industry*; Rajhans, GS, Blackwell, DSL; Butterworth; 1985.

30. *Protecting Personnel at Hazardous Waste Sites*; Levine, S.P., Martin, W.F.; Butterworths.

31. *Safety and Health in Building and Civil Engineering Work*; International Labor Office, Geneva; 3rd Printing, 1985.

32. *The Health Physics and Radiological Health Handbook*; Nucleon Lectern Associates, Inc. Schleien, B. et. al. editors; 1984.

33. *The Industrial Environment -- Its Evaluation and Control*; US Public Health Service, Centers for Disease Control, NIOSH; 1973.

34. *The Merck Index, An Encyclopedia of Chemicals and Drugs*; 11th Ed. Merck Company; 1989.

35. *Threshold Limit Values and Biological Exposure Indices for 1993-1994*; American Conference of Governmental Industrial Hygienists (ACGIH).

1.04 PLAN DESCRIPTION

A. Contractor shall provide a Health and Safety Plan (HASP) which establishes policies and procedures to protect workers and the public from the potential hazards posed by the work. The HASP must be developed before site activities proceed.

1. At a minimum the plan shall:

a. Name key personnel and alternates responsible for site safety.

b. Describe risks associated with each operation conducted.

c. Confirm that personnel are adequately trained to perform their job responsibilities and to handle the specific hazardous situations they may encounter.

d. Describe the protective clothing and equipment to be worn by personnel during various site operations.

e. Describe any site-specific medical surveillance requirements.

f. Describe the program for periodic air monitoring, personnel monitoring, and environmental sampling (if needed).

g. Describe the actions to be taken to mitigate existing hazards to make the work environment less hazardous.

h. Define site control measures and include a site map.

i. Establish decontamination procedures for personnel and equipment.

j. Set forth the site's Standard Operating Procedures for Health and Safety.

B. Definitions

As used in the HASP, the following terms are defined:

- Active Operations - Activities resulting in disturbance of waste, soil, buildings, or equipment at a work area.

- Authorized Personnel - Any person, such as task-specific personnel, project personnel, oversight personnel, contractors, and consultants whose presence is authorized at the Project Site by Owner.

- Contamination Reduction Zone (CRZ) - The area that borders the Exclusion Zone before entering the Support Zone. This is the area where decontamination takes place.

- Contractor/Subcontractor - Any person or firm, retained or hired by Contractor, to carry out and/or supervise any portion of the activities conducted at the Project Site.

- Exclusion Zone - The area in which all personnel entering must be directly involved in the ongoing work, have designated personal protective equipment (PPE), and meet training and medical monitoring requirements. The exclusion zone will be defined by an approximate 25 feet radius around the work area or an appropriate physical barrier, which will be suitably marked.

- MSDS - Material Safety Data Sheets, which provide information on the physical, chemical, and hazardous properties of chemical compounds.

- Oversight Personnel - Any person, designated by the State, Federal Government, or Owner who is assigned to carry out oversight work.

- PPM - Parts per million; expressed as PPM(v) for gases and vapors.

- Project Personnel - Any person or contractor, assigned by Owner, its consultants, its contractors or subcontractors, to carry out work at the Project Site (e.g., Project Director, Project Manager, etc.).

- Project Health and Safety Officer - The designated person responsible for overall implementation of the Health and Safety Plan.

- Project Site - The area defined by a specific project Work Plan, as well as contiguous areas to which access is required for the execution of the field tasks which may be set forth in a Work Plan.

- Site Safety Officer - The person(s) designated by Contractor who is responsible for supervising the Health and Safety Plan.

- Support Zone - The area outside the exclusion zone that is considered clean for the purpose of the Health and Safety Plan. It is used for transfer of equipment and materials (i.e., support) into the secure area.

- Task-Specific Site Personnel - Any person or subcontractor assigned by Contractor to carry out work at the Project site.

- Secure Zone - The area within a radius of approximately 50 feet established from the center of the work area, or an appropriate physical barrier (e.g. remediation site) and indicated by a visible surface device.

1.05 SUBMITTALS

A. Submit plans in accordance with Section 01340.

B. In accordance with time frame outlined in Submittal Schedule:

1. Written HASP containing all requirements under 29 CFR 1910.120. The plan shall be written to

avoid misinterpretation, ambiguity, and mistakes that verbal orders cause.

2. HASP approvals by appropriate and qualified Contractor personnel for review by Owner, Engineer, and by regulatory agencies.

3. Documentation of medical monitoring.

4. Documentation of personnel training.

5. Documentation of personnel respirator qualification and fit testing.

C. During Construction Activities:

1. All required forms and OSHA records will be kept on site as applicable.

1.06 PRODUCT

A. Contractor shall provide a HASP consistent with the recommended format as outlined in reference No. B25, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. Minimum HASP requirements are described according to the following sample outline:

i. Table of Contents
ii. Tables and Figures
iii. Addenda

1.0 INTRODUCTION

1.1 Scope and Applicability of the HASP

A. Identify, evaluate, and control potential safety and health hazards.

B. Provide emergency response provisions for accidents during work operations.

1.2 Definition

A. To avoid misunderstanding on site, list the following items:

1. List of terms referenced in HASP.
2. List of term definitions.

1.3 Visitor Requirements on Site

A. Visitors may periodically visit the site. The visitors must:

1. Be able to identify the secure zone and understand procedures.

2. Know and follow sign in/sign out procedures.

3. Show documentation of appropriate training and medical monitoring which is required in secure work zones.

2.0 KEY PERSONNEL/IDENTIFICATION OF HEALTH AND SAFETY PERSONNEL

A. Identify key personnel (and alternates) and organizational responsibilities for site safety. Also identify key personnel assigned to various operations. List telephone numbers, addresses, and organizations of these people.

2.1 Key Personnel

A. List and define key project personnel on site and off site. Include names, title, and office phone number.

2.2 Site Specific Health and Safety Personnel

A. List site health and safety personnel and alternates. Include name, title, and office phone number.

2.3 Organization Responsibilities

A. Specify minimum responsibilities of key project and health and safety personnel.

3.0 TASK/OPERATION SAFETY HEALTH RISK ANALYSIS

3.1 Historical Overview of Site

A. Include a site history.
B. Include a site map to provide an understanding of the geographical area.

3.2 Task/Risk Analysis

A. Identify and evaluate any potential physical, biological, radiological, or chemical hazards. Express potential impact on workers or the public.

B. Instructions

1. Identify chemical hazards including:

   a. respirable dust
   b. skin contact/absorption hazards
   c. accidental ingestion

2. Identify electrical hazards including:

   a. overhead electrical lines
   b. buried electrical lines
   c. de-energize electrical lines as required

3. Identify mechanical hazards including:

   a. moving equipment and vehicles
   b. rotating machine parts
   c. lockout/tagout moving machinery, as required

4. Identify fire/explosion hazards including:

   a. gasoline powered equipment
   b. smoking
   c. flammable fumes and vapors
   d. burning and welding
   e. compressed gases (e.g., natural gas, compressed air)

5. Identify heat and cold stress hazards including:

   a. extremely hot, humid weather
   b. extremely cold, windy weather

6. Identify acoustical hazards including:

   a. noisy equipment/machinery

7. Identify physical hazards including:

   a. slippery or uneven walking surfaces
   b. tripping hazards

8. Identify construction hazards:

   a. confined space
   b. trenching/shoring
   c. site vehicular traffic

9. Identify unanticipated hazards.

4.0 PERSONNEL TRAINING REQUIREMENTS

4.1 Training and Briefing Topics

A. Pre-project briefing meeting covering the following HASP topics:

- site characterization
- hazards
- medical surveillance requirements
- symptoms of overexposure to hazards
- site control
- training requirements
- monitoring equipment

B. Have all site workers sign an acknowledgment form attesting to attendance at the pre-project meeting, understanding of safety rules and documentation and understanding of respirator fit test. All site workers must also read and sign the Rhone-Poulenc "General Safety Rules for Contractor's Employees."

C. Hold a daily safety meeting to be held by the designated site safety officer to discuss specific current safety issues and as a daily safety reminder.

1. Suggested topics to be covered:

a. personal protective equipment
b. hazards
c. any injuries or close calls
d. weather related issues

5.0 PERSONAL PROTECTIVE EQUIPMENT TO BE USED

A. Define levels of protection required for work activities in terms of work location and/or work function. Define specific types of respirators and protective clothing for each level.

5.1 to 5.5 Level A, B, C and D Personal Protective Equipment

A. After review of hazards and the greatest expected exposure, select levels A-D personal protective equipment. Due to the identified contaminants, level A is not likely to be required. Describe levels of protection worn by personnel and delineate specific job functions.

5.1 Level A - worn when the highest level of respiratory, skin, and eye protection is needed.

5.2 Level B - worn when the highest level of respiratory protection is needed, but a lesser level of skin protection.

5.3 Level C - worn when the criteria for using air-purifying respirators are met based on toxins and/or air monitoring results.

5.4 Level D - worn only as work uniform and not on any site with respiratory or skin hazards. (Note: Modified Level D is sometimes worn and includes wearing a Tyvek coverall.)

5.5 The level of protection is selected based on:

- Type and measured concentration of the chemical substances in the ambient atmosphere and their toxicity.
- Potential for exposure to substances in air, splashes of liquids, or other direct contact with material due to work being done.

5.6 Reassessment of Protection Program

A. Levels of protection shall be upgraded or downgraded based upon changes in site conditions or later findings.

5.7 Work Mission Duration

A. The anticipated duration of the work mission is established.

B. Conditions that affect work mission duration to be addressed in this section are:

- cold and heat
- capacity to work in full face respirators
- air supply consumption of SCBAs

5.8 Chemical Resistance and Integrity of Protective Material

A. Personal protective equipment must be specific for the tasks performed in the HASP.

B. The Quick Selection Guide to Chemical Protective Clothing provides a quick reference.

5.9 Standard Operating Procedures for Respiratory Protection Devices

A. Checklists for pre-use inspection, reinspection, and periodic inspection.

5.10 Standard Operating Procedures for Personal Protective Clothing

A. Checklists for pre-use inspection and reinspections.

5.11 Specific Levels of Protection for Site

A. Based on anticipated hazards, the specific levels of protection are listed.

1. Level A
2. Level B
3. Level C
4. Level D (or Modified Level D)

B. List all types of personal protective equipment to be used on site for each level.

6.0 MEDICAL SURVEILLANCE REQUIREMENTS

A. Develop a medical surveillance program by a Board Certified or Qualified to be Board Certified Occupational Physician.

6.1 Baseline or Pre-assignment Monitoring

A. Document medical monitoring for all personnel working in the Secure Zone.

B. Examinations shall include items that comply with medical monitoring requirements of 29 CFR 1910.120(F).

C. The medical monitoring physical must certify the ability of personnel to use air purifying respirators and to be medically able to perform specific tasks.

6.2 Periodic Monitoring

A. Perform periodic monitoring (medical physical) for personnel working in the secure zone required within the last 12 months.

B. Monitoring documentation maintained on Site.

6.3 Specific Medical Monitoring

A. Monitoring for symptoms related to the possible exposure of harmful chemical compounds.

B. Physical injuries during performance of tasks covered by HASP.

C. Visually monitor personnel for signs of heat or cold overexposure.

6.4 Exposure/Injury/Medical Support

A. Make provisions for special circumstances which may require medical attention of a physician.

7.0 FREQUENCY AND TYPES OF AIR MONITORING AND PERSONNEL AIR SAMPLING

A. The purpose is to identify and quantify airborne contaminants in order to verify and determine the level of personal protection required.

B. Two principal methods are used:

- Continuous air monitoring using direct reading instrument, (e.g. HNU, combustible gas/oxygen meter, dust monitors.)

- Composite air monitoring obtained by sorbent (e.g. charcoal and silica gel tubes collected by a personal pump).

7.1 Direct-Reading Monitoring Instruments

A. Direct Reading Instruments are used in the Secure Zone.

B. Determine Direct Reading Instrument based on anticipated contaminants and confined space entry requirements.

C. Calibrate instruments each morning and each afternoon.

7.2 Personal Sampling

A. Based on contaminants, identify personal sampling pumps with collection tubes that may be used.

7.3 Specific Contaminants that may be Monitored at Site Location

A. Constituents

(Chromium, tricloroethene, etc.)

8.0 SITE CONTROL MEASURES

8.1 Buddy System

A. Work in the Secure Zone shall be scheduled to assure no person works alone.

B. Visual contact shall be maintained at all times.

C. Buddy system shall be required when working on or near water hazards including the use of a life line.

D. Appropriate trained personnel (authorized entrants, attendants, entry supervisors and rescue and emergency services) for permit-required confined space.

8.2 Site Communications Plan

A. Provide a communication system which includes the following elements.

1. telephones
2. 2-way radios
3. hand signals
4. verbal communication
5. other (horns, whistles)

8.3 Work Zone Definition and Site Access

A. Work zone definition incorporates the following elements:

1. Exclusion Zone

2. Secure Zone

3. Contamination Reduction Zone

4. Support Zone

5. Control procedures to prevent unauthorized access. Require a check-in and check-out system to control and record each individual and piece of equipment in each area.

6. Site security procedures - (fences, signs, sign in/sign out procedures)

B. Identify on the site map:

1. Exclusion zone, secure zone, contamination reduction zone, and support zone.

2. Indicate the sizes of zones, zone boundaries, and access control points into each zone.

8.4 Nearest Medical Assistance

A. Provide the name, address, and telephone of nearest medical assistance and location of on site medical assistance (if appropriate).

B. Provide a map to nearest medical facility.

C. Provide written directions to nearest medical facility.

8.5 Safe Work Practices

A. List safe work practices that are mandatory and enforceable at site location. These work practices must be consistent with the Rhone-Poulenc "General Safety Rules for Contractor's Employees."

8.6 Emergency Alarm Procedure

Address site emergencies or occurrences that require immediate actions to prevent additional problems or harm to responders, the public, property, or the environment.

A. Establish Site Emergency Procedures

1. List names and emergency functions of on site personnel responsible for emergency actions. Indicate training they have received.

2. Provide communication plan and alternate means for emergency communications.

3. List names, telephone numbers, and locations of emergency organizations that might be needed.

4. Address and define procedures for rapid evacuation of personnel.

5. List emergency equipment.

6. Address emergency medical care.

7. Advise site-personnel of their duties in an emergency.

8. Provide for emergency decontamination of injured personnel.

9. Provide a map(s) with route(s) to nearby hospital(s) and pre-arrangements for emergency medical treatment.

10. Coordinate with rescue and emergency services prior to permit entry confined space.

9.0 DECONTAMINATION PLAN

9.1 Standard Operating Procedures

A. Establish decontamination procedures for personnel and equipment.

B. Arrange for proper disposal of contaminated material, solutions, and equipment.

Follow specifics as stated in *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.* NIOSH/OSHA/USCG/EPA; US Department of Health and Human Services, Public Health Service, Center for Disease Control, NIOSH; 1985 and Tennessee Department of Environment and Conservation's "Hazardous Substance Site Remedial Action Draft Rules, July 1993."

9.2 Levels of Decontamination Protection Required for Personnel

A. Establish the level of decontamination based on anticipated levels of contaminants.

9.3 Equipment Decontamination

A. Establish decontamination procedures for equipment and arrange for disposal of solutions and/or equipment.

9.4 Disposition of Decontamination Wastes

A. Establish decontamination waste disposal. This includes solutions and/or equipment.

10.0 EMERGENCY RESPONSE/CONTINGENCY PLAN

A. Provide an Emergency Response/Contingency Plan established with the following objectives:

1. Pre-Emergency Planning

2. Personnel Roles and Lines of Authority

3. Emergency Recognition and Prevention

4. Evacuation Routes and Procedures/Safe Distances

5. Site Security and Control

6. Emergency Decontamination Procedures

7. Emergency Contact/Notification System and Alerting Procedures including alternate means of communication

8. Emergency Medical Treatment Procedures

9. Fire or Explosion Response Procedures

10. Spill or Leak Response Procedures

11. Personal Protective Equipment and Emergency Equipment

12. Rescue and Emergency Services

11.0 SPILL CONTAINMENT PROGRAM

A. Provide a spill containment program identifying possible spill potential and containment procedures and equipment.

1. List emergency contacts and phone numbers

2. List types and location of spill containment materials

[END OF SECTION]

SECTION 01200

PROJECT MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Phase 2 meeting

B. Progress meetings

D. Final inspection

1.02 PRE-CONSTRUCTION MEETING

A. Prior to the start of construction by the successful bidder, a pre-construction meeting will be held with Owner, Engineer, Contractor, Health and Safety personnel, Surveyor, and Subcontractor representatives at Owner's request.

B. Contractor shall be prepared for this meeting which may be held within one week after the issuance to Contractor of the Notice to Proceed.

1.03 PHASE 2 MEETING

A. After completion of all Phase 1 activities, data collection, and data review and prior to start of any Phase 2 activities, a meeting will be held with Owner, Engineer, and Contractor, at Owner's request.

B. The intent of the meeting is to discuss soil processing operational parameters selected based on the Phase 1 Full-Scale Soil Processing Test results. Modifications to the approach to full-scale treatment (e.g., project schedule, specific work hours, the project Health and Safety Plan, etc.) will be discussed and determined. Contract modifications, if required, based on the outcome of Phase 1 results, must be discussed and agreed upon prior to the start of Phase 2 Work.

1.04 PROGRESS MEETINGS

A. Construction progress meetings shall be held once every two weeks, or more frequently if directed by Owner or Engineer. The meetings at a minimum will be attended by Engineer and Contractor and may also include Owner, Subcontractors, Health and Safety

personnel and other personnel as deemed appropriate.

1.05 FINAL INSPECTION

A. The Contractor shall attend the final inspection called for in Section 01700.

[END OF SECTION]

SECTION 01340

SUBMITTALS, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittal procedures and requirements for Contractor-prepared documents, product data, samples, and Shop Drawings.

B. Contractor shall make and submit all submittals as called for herein and as may be reasonably required.

C. The Engineer shall evaluate equipment, plans, procedures, materials, or any other items that the Contractor plans to use.

1.02 ACCEPTANCE OF SUPPLIERS

A. The Contractor shall provide the name of the supplier, manufacturer, or vendor for each material specified in the technical sections of this specification. Submittals shall be made at the times identified in the submittal schedule provided in Specification 00200 - Supplemental Instructions to Bidders. If not specified in the submittal schedule, then submittal must be within one (1) week of Contract award. No awards shall be made by Contractor, and no Work under any item shall proceed, until acceptance of the manufacturer or vendor has been given by the Owner's Representative. Such acceptance will be only on the basis of the manufacturer's or vendor's experience and reputation and will not imply that the product or material will perform acceptably.

1.03 SHOP DRAWING AND WORK PLAN SUBMITTAL REQUIREMENTS

A. Shop Drawings, Work Plans, and data shall be submitted to the Engineer for each item specified in the technical sections of this specifications. Submittals shall be made as specified in the submittal schedule provided in Specification 00200 - Supplmental Instructions to Bidders. Otherwise, submittals shall be made sufficiently in advance of the time when items included therein are to be incorporated into the Work to permit proper review, necessary revisions, and resubmittals without causing a delay in the performance of the Work.

B. Shop Drawings and Work Plans shall present complete and accurate information, and any other items of information that are required to demonstrate detailed compliance with the Contract Documents.

C. Each Shop Drawing and Work Plan submitted shall be presumed to have been reviewed by Contractor before being submitted to the Engineer. The Contractor's submittal of a Shop Drawing and Work Plan shall represent that the Contractor has determined and verified all quantities, dimensions, field construction criteria, and similar data and that he has reviewed or coordinated each Shop Drawing and Work Plan with the requirements of the Work and the Contract Documents.

D. Unless otherwise permitted in specific cases, all data shall be transmitted to the Engineer by the Contractor. Each Shop Drawing and Work Plan shall indicate the following:

1. Project name and current contract number

2. Notation as to whether original submittal or resubmittal

3. Date received by Contractor from Manufacturer or vendor

4. Date submitted to the Engineer

5. If required, the signature and seal of a registered land surveyor, registered professional engineer, or code certification

E. Each Shop Drawing and Work Plan submittal shall be accompanied by a transmittal letter indicating the item or items submitted, with particular reference to latest revised list of equipment, materials, procedures and other items. The transmittal letter shall also indicate whether the submittal constitutes a complete set of drawings for the item, a partial set of drawings for which additional submittals are to be expected by the Engineer, or a partial set of drawings to complete a previous submittal. In any case, the Contractor shall indicate by the transmittal letters when the submittals for an item are intended to be complete.

F. For each Shop Drawing and Work Plan Submittal the Contractor shall submit five (5) complete submittals each of which will include all drawings, catalog data, and similar items for review. This number includes one for return to the Contractor.

If the Contractor desires more than one copy returned to him, he shall submit with the initial and any subsequent transmittals the additional number desired up to a maximum of three copies.

G. If the Engineer requires additional copies, he will so inform the Contractor upon return of the material reviewed.

1.04 REVIEW OF SHOP DRAWINGS AND WORK PLANS

A. The Engineer's review of Shop Drawings and Work Plans is for general compliance with the Contract Documents only and is not a complete check on the method or procedures, assembly, erection, or construction. Such review shall in no way be construed as permitting any departure whatsoever from the Contract Documents, except where the Contractor has previously requested and received written approval of the Engineer for such departure.

B. Review of Shop Drawings and Work Plans by the Engineer will be limited to completed submittals except where review of a partial submittal is specifically requested by the Contractor and where such review of a partial submittal is necessary for timely completion of the Work of the Contract. Where Shop Drawings and Work Plans of related items are necessary for review of a particular submittal, the Engineer will so inform the Contractor, who will promptly submit said related items.

C. Drawings, Work Plans, and similar data will be reviewed and stamped by the Engineer as follows:

1. "Approved," if no change or rejection is made. One copy of the submitted data will be returned.

2. "Approved as Noted," if minor changes or additions are made but resubmittal is not considered necessary. All but four copies of the submitted data will be returned and all copies will bear the corrective marks.

3. "Resubmit," if the changes requested are extensive or if retransmittal of the submittal to a Subcontractor is required. In this case, the Contractor shall resubmit the items after correction, and the same number of copies shall be included in the resubmittal as in the first submittal. One copy of the first submittal

will be retained by the Engineer and two copies will be returned to the Contractor.

4. "Rejected," if it is considered that the data submitted cannot, with reasonable revision, meet approval or when the data submitted are not sufficiently complete to establish compliance with the Contract Drawings and Specifications. One copy will be retained by the Engineer and two copies will be returned to the Contractor.

D. Approval of Submittals will not relieve the Contractor of his responsibility for any deviations from the Contract Documents nor from his responsibility for errors or omissions in the Submittal. Contractor will be responsible for all matters relating to fabrication, shipping, handling, storage, assembly, installation, construction (including all safety aspects of performing the work), and for coordinating the work.

1.05 SAMPLES

A. Samples of materials shall be submitted to the Engineer as required on the latest revised list. The samples shall be properly identified by tags and shall be submitted sufficiently in advance of the time when they are to be incorporated into the Work, so that rejections thereof will not cause delay. A letter of transmittal from the Contractor requesting approval shall accompany such samples. The procedures set forth for Shop Drawings shall be used for processing samples.

[END OF SECTION]

SECTION 01400

CONSTRUCTION QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section includes guidelines and procedures for Construction Quality Control during execution of the Work as outlined in the Specifications and on the Contract Drawings.

1.02 RELATED SECTIONS

A. Section 01050 - Field Engineering

B. All applicable technical sections of the specifications.

1.03 DEFINITIONS

A. Construction Quality Assurance (CQA) - A planned and systematic pattern of means and actions designed to provide adequate confidence that items or services meet contractual and regulatory requirements.

B. Construction Quality Control (CQC) - Those actions which provide a means to measure and regulate the conformance of an item or service to contractual and regulatory requirements.

C. MDEQ - Mississippi Department of Environmental Quality.

D. Owner - Rockwell International Corporation (Rockwell).

F. Contractor - The person, firm, or corporation with whom Owner has entered into the Contract.

G. Engineer - The Owner or Owner designated representative retained to conduct observation on behalf of the Owner.

H. Surveyor - The Surveyor, licensed in the State of Mississippi, hired by the Contractor to perform surveying associated with the Work.

1.04 SUBMITTALS

A. Submit information as required in the technical sections of the specifications.

1.05 QUALITY CONTROL

A. The Contractor shall retain an independent licensed Surveyor (Certifying Surveyor) who shall be responsible for all survey work associated with the Contractor's work.

B. The Engineer shall perform quality assurance observation, soil sampling, and testing. Such observation, sampling, and testing shall not relieve Contractor of his sole responsibility for the quality of all Work performed by Contractor and his Subcontractors.

C. The approved Contractor submitted Work Plans along with applicable technical sections of the Project Specifications, related regulatory requirements, and other appropriate criteria to be utilized during construction shall be the responsibility of the Contractor to implement.

1.06 DOCUMENTATION

A. The applicable technical sections of the Project Specifications detail the record keeping which will be used to document the Construction Quality Assurance activities performed during construction. The Contractor shall be responsible for all work designated as his responsibility.

1.07 ADDITIONAL ANALYSES DURING CONSTRUCTION

A. At his sole discretion, the Engineer may conduct sampling and analysis as required for the purpose of assessing the impact to the environment caused by remedial construction activities.

B. The Engineer may sample and analyze soil from within the excavation, preprocessed soil, processed soil, and treated soil. The Contractor shall cooperate with the Engineer in collecting the samples.

C. The Engineer may sample and analyze water as necessary for characterization for on site treatment and to document discharge levels.

D. The Engineer may sample and analyze as necessary air from the air extraction pipes of the soil cell and mixer.

E. It is not the Engineer's intent to collect and analyze any media samples pertaining to health and safety. Any sampling and analyses necessary to protect the health and safety of the Contractor's employees and/or agents and others shall remain the sole responsibility of the Contractor.

F. The Contractor shall sample and analyze all soil, water, and other material to be disposed of off site to characterize the material for legal disposal.

G. The Contractor shall provide the Engineer with a copy of all sampling and analysis results.

[END OF SECTION]

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone service, water, and sanitary facilities, field offices, and laboratory space.

B. Temporary Controls: Barriers and enclosures for protection of the Work and water control.

1.02 RELATED SECTIONS

A. Section 01540 - Security

B. Section 01700 - Contract Closeout

C. Section 13200 - Soil Cell Treatment

D. Section 02940 - Removal of Temporary Construction and Site Restoration

1.03 TEMPORARY ELECTRICITY

A. Source of electrical service shall be provided by Randall Textron. The Contractor shall be responsible for all modifications to power to make it suitable for his use and for service hookup required from utility source. Electricity shall be paid for by the Contractor for the duration of the project.

1.04 TEMPORARY LIGHTING

A. Provide and maintain adequate lighting for construction operations.

B. Provide and maintain adequate lighting to interior work areas after dark for security purposes.

C. Maintain lighting and provide routine repairs.

D. The ballfield lighting is available for use by the Contractor. Electrical use for the lighting shall be metered and Randall Textron compensated accordingly for the electricity used.

1.05 TELEPHONE SERVICE

A. Provide, maintain, and pay for telephone services to field office.

1.06 TEMPORARY WATER SERVICE

A. Provide and maintain required facilities.

1.07 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures.

1.08 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Protect vehicular traffic, stored materials, site, and structures from damage.

1.9 PROTECTION OF INSTALLED WORK

A. Protect completed Work and provide special protection where specified in individual Specification sections.

1.10 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove non-hazardous waste materials, debris, and rubbish from site periodically, and legally dispose off-site.

C. Coordinate temporary storage and removal of regulated waste with Owner. Submit name and address of disposal facility to Owner for approval prior to off-site disposal of materials. Contractor shall be fully responsible for legal off-site disposal of all materials, including staging, containerizing, testing, and transportation.

1.11 FIELD OFFICE

A. A field office shall be supplied by the Contractor for use by the Engineer and the Contractor. The

office shall have a separate private office with a locking door for the Engineer. The Engineer's office shall have a refrigerator for environmental samples, a desk, and a telephone and be large enough to set up a field gas chromatograph and ancillary equipment. The office shall have air conditioning and proper lighting.

1.12 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary above grade or buried utilities, equipment, facilities, fences and materials prior to substantial completion (as defined in Section 01700).

B. Clean and repair damage caused by installation or use of temporary work.

[END OF SECTION]

SECTION 01540

SECURITY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Security Control Measures and Protocol

B. Work Area Security

1.02 RELATED SECTIONS

A. Section 00700 - Terms and Conditions

B. Section 01160 - Health and Safety Plan

C. Section 02700 - Chain Link Fence

1.03 SUBMITTALS

A. Submit a written Project Security Control Plan

1.04 PROJECT SECURITY CONTROL MEASURES

A. Protect Work from theft, vandalism, and unauthorized entry and follow security procedures outlined in the Project Security Control Plan.

1.05 WORK AREA SECURITY PROTOCOL

A. Develop a project Security Control Plan and submit for review in accordance with the Submittal Schedule included with the Bid Form. Include Security Protocol which addresses the following items at a minimum:

1. Personnel responsible for implementing and maintaining security measures in the work area including names and assigned functions

2. Description of proposed daily security operations

3. Description of proposed methods and frequency of security checks at the project site, if required

4. Description of proposed methods for responding to the following breaches in security

a. Entry of unauthorized personnel into the work area

b. Site boundary security provisions are breached

1.06 WORK AREA SECURITY

A. Contractor shall provide temporary security for the duration of the project. A chain link fence specified in accordance Section 02700 - Chain Link Fence shall be installed to provide security in area employed by contractor as "Project Limits of Work".

B. Contractor shall be responsible for all costs associated with providing the access restriction features, maintaining all features during construction, and removing and disposal of temporary features at the conclusion of the Project.

C. Contractor shall maintain a list of personnel allowed in the work area and at the project site, exclude entry of all others, and shall perform record keeping in accordance with approved Health and Safety Plan. All individuals requesting access shall be required to display identification.

D. Contractor shall maintain a current log of all visitors entering and leaving the site.

E. Contractor shall immediately notify Owner and Engineer of any attempts to enter the work area by unauthorized personnel or visitors.

1.07 SITE ACCESS

A. Access to the site shall be limited to Owner, Engineer, Contractor employees, and designated Subcontractor employees, and State and Federal inspectors that are approved for entrance. Control of persons and vehicles entering and leaving the project site is the responsibility of the Contractor. Contractor will allow no visitors without the approval of Owner. Visitors may only enter hazardous areas in accordance with all of the requirements of the approved Health and Safety Plan.

[END OF SECTION]

SECTION 01600

PROTECTION OF WORK AND PROPERTY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Protection of work, property, existing structures, and existing subsurface structures.

1.02 RELATED SECTIONS

A. Section 00700 - Terms and Conditions.

B. Section 01540 - Security.

1.03 CARE AND PROTECTION OF THE WORK

A. From the commencement until the acceptance of the Work, the Contractor shall be solely responsible for the care of the Work covered by the Contract and for the materials, supplies, and equipment delivered at the Contract work area intended to be used in the Work; and all injury or damage to the same from whatever cause, shall be made good at his expense. He shall provide suitable means of protection for and shall protect all materials intended to be used in the Work, all Work in progress, and all completed Work. He shall take all necessary precautions to prevent injury or damage to the Work by flood, fire, freezing, or from inclemencies of the weather.

1.04 REPLACEMENT OF PROPERTY

A. The Contractor shall replace all pavement, driveways, fences, shrubs, lawns, and any other public or private property damaged as a result of the Work under this Contract. All such replacement shall be done in accordance with the applicable specifications and no separate or extra payment will be made unless specifically provided for in the Payment Items. In all cases, said replacement shall be at least equal to the original conditions.

1.05 PROTECTION OF EXISTING STRUCTURES

A. The Contractor at his expense shall protect adjacent and other property or premises from damage of any kind during the progress of the Work and shall erect and maintain guards around his Work in such a way as to afford protection to the public. The Contractor shall be held responsible for

improper, illegal, or negligent conduct of himself, his Subcontractors, employees, and agents in and about said Work or in the execution of the Work covered by this Contract.

B. The Contractor shall, at his expense, sustain in their places and permanently protect from direct or indirect injury any and all pipelines, pavements, curbs, railways, buildings, containment structures, poles, wells, and other property in the vicinity of his Work, whether over- or underground, and he shall assume all costs and expenses for direct or indirect damage which may be occasioned by injury to any of them.

D. The Contractor shall at all times have on the ground suitable and sufficient material and shall use the same as may be necessary or required for sustaining and supporting any and all such structures which are uncovered, undermined, weakened, endangered, threatened, or otherwise materially affected.

1.06 EXISTING SUBSURFACE STRUCTURES

A. General

1. The Contractor shall be responsible for identifying all monitoring wells prior to start of construction to provide for their protection. Damage to any well shall be repaired at the Contractor's expense. Monitoring wells MW-2, MW-6, and MW-17 are located within the limits of excavation. The Contractor shall provide a list of any additional subsurface structures found, their location, and indicate how these structures are to be protected. The Contractor shall protect these structures or repair damaged structures at his expense and the Contractor shall not be entitled to claim any damages for or on account of the presence of such structures.

2. The Contractor agrees that he shall neither have nor assert against the Owner or Engineer any claim for damages or relief from any obligation of this Contract by reason of the inaccuracy, inadequacy, incompleteness, or other deficiency of the information given or the failure to furnish additional or further information in the possession of the Owner or Engineer.

[END OF SECTION]

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Drawings and Submittals

B. Substantial Completion

C. Final Payment

1.02 RELATED SECTIONS

A. Section 00700 - Terms and Conditions

1.03 PROJECT RECORD DRAWINGS AND SUBMITTALS

A. Contractor shall keep at the site of Work at least two copies of the Contract Documents and reviewed Shop Drawings of Submittals and shall at all times provide Engineer access thereto. One copy shall be available for ready reference and the other shall be used for record purposes.

B. The copy of Drawings provided to Contractor for record purposes shall be annotated by Contractor and the licensed Surveyor hired by the Contractor to record all changes made during the construction process. Said copy shall be available to Engineer and shall be delivered to him by Contractor upon completion of Work so that record drawings can be prepared.

1.04 SUBSTANTIAL COMPLETION

A. The Work of the Contract shall be deemed substantially complete when one of the following occurs:

1. When the Work of the Contract is at least 99 percent complete as evidenced by a list of minor items to be completed with estimated value equal to or less than 1 percent of the value of the contract payments as shown in current estimates of Work completed.

2. When Owner and Contractor reach mutual written agreement that Work is substantially completed.

B. The Contract will be considered as a single unit for determination of substantial completion except as follows:

1. Where Owner and Contractor reach mutual written agreement that a major part of the Contract can be separately determined to be substantially complete.

C. The date of substantial completion shall be evidenced by a certificate of substantial completion signed by Contractor, Engineer, and Owner.

1.05 FINAL INSPECTION AND CERTIFICATE OF SUBSTANTIAL COMPLETION

A. Owner, Engineer, MDEQ, and Contractor will make an inspection as soon as possible after written notification by Contractor to Owner that the Work is 99 percent complete, or that Owner and Contractor mutually agree that the Work appears substantially complete. Following said Final Inspection, Engineer will advise Contractor of remaining items to be completed or corrected to arrive at completion of the Work inspected.

B. When the remaining items of Work to be completed or corrected are of sufficiently reduced value that substantial completion is indicated, Contractor will prepare a detailed estimate (hereinafter referred to as estimate of Work remaining) of the value of said items showing each item's separate value as well as the total value of all items. Contractor shall enclose said estimate as evidence of agreement.

C. Substantial completion will be evidenced by a certificate of substantial completion signed by Contractor, Engineer, and Owner. The date of substantial completion shall be that date specified in the certificate of substantial completion. The estimate of Work remaining will be attached to the certificate of substantial completion.

1.06 PAYMENT AT SUBSTANTIAL COMPLETION

A. The application for payment at substantial completion shall be in a form satisfactory to Owner and shall be accompanied by the following documents:

1. Certificate of substantial completion with estimates of Work remaining attached.

2. A schedule endorsed by Contractor showing time of completion of all remaining Work.

3. An affidavit from Contractor: (1) that the claims of all Sub-contractors, Suppliers, laborers, and all other persons and parties furnishing labor and materials with respect to the Contract have been paid in full except as noted; (2) that Contractor will pay in full the exceptions stated from the proceeds of this payment; and (3) that Contractor acknowledges that Owner has made this payment in reliance upon this affidavit.

4. Releases or receipts evidencing payment of all liens which may have been filed as a result of the performance of Work of the Contract.

5. A written statement for surety that the labor and material bond and the performance bond, each in the amount of 100 percent of the value of the Contract, are in force and will remain in force for a period of 1 year following the date of substantial completion or such later date as may be established by an extension of the guarantee period.

B. Payment at substantial completion will be an amount equal to the value of all Work of the Contract which has been declared substantially complete including the estimated value of the minor items to be completed or corrected less an amount equal to twice the total estimate of Work remaining, less an amount withheld to satisfy any outstanding claims, liens or judgments, less any changes for delay, and less all prior payments including those related to Change Orders, which shall be subject to correction by the payment at substantial completion.

[END OF SECTION]

DIVISION 2 - SITE WORK

SECTION 02110

CLEARING, GRUBBING, AND TOPSOIL REMOVAL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall furnish all labor, materials, tools, supervision, transportation, installation equipment, and incidentals necessary to complete the work specified herein and as necessary for a complete installation. The work shall include, but not necessarily be limited to: (i) clearing and grubbing the work area of trees, brush, stumps, bogs, decayed or growing organic matter, and incidental debris; (ii) stripping topsoil from the two areas of contaminated soil excavation and moving the topsoil to temporary stockpiles.

1.02 RELATED SECTIONS

A. Section 01600 - Protection of Work and Property

B. Section 02220 - Excavation

C. Section 02900 - Fertilizing, Seeding, and Landscaping

D. Section 02931 - Dust, Erosion, and Sediment Control

E. Section 13270 - Supplmental Conditions for Earthwork

1.03 DEFINITIONS

A. Topsoil: Those materials consisting of soil, grass, or other vegetation to a one (1) foot depth.

B. Soil: Those materials which underlie the ground surface and any topsoil.

PART 2 - EXECUTION

3.01 CLEARING AND GRUBBING

A. Clearing and grubbing shall only be performed as necessary for completion of the project within the Excavation Construction Limits shown on the Drawings. All appropriate erosion and sedimentation controls shall be in place before the start of clearing as described in Section 02931 - Dust, Erosion, and Sediment Control and in the

Contractor-submitted and Engineer-approved Soil Erosion and Sediment Control Plan.

B. If weather conditions are unsuitable for clearing and grubbing, as determined by the Engineer, the Contractor shall cease operations until permission to resume operations is obtained from the Engineer.

C. The Contractor shall clear all areas required for access to site and execution of work. Clearing shall consist of removing all trees, vegetation, logs, stumps, roots, brush, rotten wood, and other refuse from the glearing and grubbing operations. The cleared material shall be burned on site within the Project Limits of Work.

D. Burning of the cleared material must utilize a forced-draft air system to improve combustion rate and reduce smoke. Starter or auxiliary fuels which cause excessive smoke (rubber tires, plastic, etc.) shall not be used. Burning shall not take place when a High Fire Danger Alert is declared by the Mississippi Forestry Commission.

3.02 TOPSOIL AND SOIL REMOVAL

A. Before stripping or removing topsoil, the Contractor shall mow, cut, or otherwise remove all heavy grass, weeds, trees, or other vegetation over areas from which topsoil is to be removed.

B. Topsoil shall be removed to a one (1) foot depth in the excavation areas.

C. If weather conditions are unsuitable for topsoil removal, as determined by the Engineer, the Contractor shall cease removal and stockpiling operations as requested by the Engineer.

3.03 TOPSOIL STOCKPILING

A. The Contractor shall keep stripped topsoil separate from other excavated materials and completely remove topsoil to the required depth from any designated area before beginning excavation work in the area.

B. Topsoil shall be temporarily placed within the excavation construction limits shown on the Drawings and within areas having approved erosion and sedimentation control measures. Topsoil shall be placed in stockpiles of neat conformations.

3.04 PROTECTION OF WORK

A. Contractor shall provide adequate means of support and protection of existing features during clearing and grubbing.

B. Contractor shall protect monitoring wells, structures, utilities, pavements, and other facilities from damage caused by equipment, lateral movement, settlement, or other hazards created by clearing and grubbing operations and as specified in Section 01600 - Protection of Work and Property.

[END OF SECTION]

SECTION 02220

EXCAVATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Contractor shall furnish all labor, materials, tools, supervision, transportation, and equipment necessary to perform excavation and hauling of contaminated soils as shown in Drawings. All work shall be performed as specified herein, as shown on the Drawings, or as necessary for completion of this project.

1.02 RELATED SECTIONS

A. Section 01050 - Field Engineering

B. Section 01400 - Construction Quality Control

C. Section 01600 - Protection of Work and Property

D. Section 01700 - Contract Closeout

E. Section 02110 - Clearing, Grubbing, and Topsoil Removal

F. Section 02931 - Dust, Erosion, and Sediment Control

G. Section 13270 - Supplemental Conditions for Earthwork

PART 2 - PRODUCTS

2.01 MATERIALS

None

2.02 EQUIPMENT

A. Appropriate equipment shall be used to perform excavation and hauling.

PART 3 - EXECUTION

3.01 EXCAVATION

A. Subsurface material shall be removed from work areas to the limits and elevations indicated on the

construction drawings. All excavation work shall be carried out in compliance with all appropriate federal, state, local and OSHA regulations.

B. Transport excavated soil to either an active soil construction area, as shown on the Drawings (i.e., stockpile area, soil processing area, etc.) or to an area previously approved by the Engineer for stockpiling within limits of construction.

C. The Contractor shall perform all excavation required to complete the Work as shown and specified. Excavations shall include earth, sand, clay, gravel, hardpan, boulders, rubbish, debris, refuse material, and all other materials within the excavation limits.

D. Stability of Excavations: All excavation work shall be carried out in compliance with all OSHA regulations, as well as any other applicable regulations. The Contractor shall maintain sides and slopes of excavations in a safe condition until completion of backfilling.

E. All excavation outside the lines and grades shown, and which is not approved by the Engineer, together with the treatment, if necessary, of the associated material, shall be at the Contractor's sole expense.

F. Contractor shall coordinate backfill of excavation with Engineer to allow sampling and analysis, of open excavation.

G. The Contractor shall prevent surface water runoff from entering the excavation. The Contractor shall provide all equipment and personnel necessary to keep the excavation free of surface water and groundwater throughout the duration of the project. All water that enters the excavation shall be collected and handled as specified in Section 13400 - Water Storage, Treatment, and Disposal.

H. All excavated contaminated or potentially contaminated soils shall be covered with an impermeable barrier throughout the duration of the project.

3.02 HANDLING OF EXCAVATED MATERIALS

A. Material removed from the excavations which, due to its size or composition cannot be processed, shall be hauled to the specified area. The stockpiling of excavated materials on-site shall only be in

areas shown on the Engineer-approved Contractor Full-Scale Soil Processing Work Plan.

B. The Contractor is advised that the disposal of excavated material in wetlands, stream corridors, and flood plains is strictly prohibited even if the permission of the property owner is obtained. If improper disposal by Contractor occurs, it will be brought to the immediate attention of the responsible regulatory agencies with a request that appropriate action be taken against the Contractor. Further, the Contractor will be required to remove the fill at his own expense and restore the area impacted.

3.03 DEBRIS REMOVED FROM EXCAVATED WASTE MATERIALS WHICH CANNOT BE PROCESSED

A. Debris removed from excavated waste material which can not be processed or returned to the excavation shall be sampled and analyzed by the Contractor for waste disposal characterization as specified in Section 13500 - Off-Site Disposal of Waste. The Contractor shall handle, transport, and dispose of waste material off-site in accordance with applicable federal, state, and local laws and regulations. Contractor shall provide Owner copies of all manifests.

B. Contractor shall use an Owner-approved disposal facility. A list of Owner-approved facilities is included in a separate document entitled "Selected Information, Randall Textron Site, Grenada, Mississippi."

3.04 SURVEYING AND CONSTRUCTION TOLERANCES

A. The Contractor shall retain an independent licensed Surveyor who shall be responsible for all surveying associated with the Contractor's work. All surveying shall be performed in accordance with Section 01050 - Field Engineering.

B. The Surveyor shall prepare record documentation in accordance with the requirements and schedule given in Section 01700 - Contract Closeout.

3.05 PRODUCT PROTECTION

A. The Contractor shall use all means necessary to protect all prior work, including all materials and completed work of other Sections.

B. In the event of damage, the Contractor shall immediately make all repairs and replacements necessary, to the approval of the Engineer and at no additional cost to the Owner.

[END OF SECTION]

SECTION 02700

CHAIN LINK FENCE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Contractor shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary to install a temporary chain link security fence with six foot fabric, top rail, bottom tension wire, and gates as specified herein, as shown on the Drawings, and as necessary for a complete installation. Upon completion of the project the fence shall be removed and reused to replace other fences temporarily removed or properly disposed of off site.

B. Contractor shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary to remove the chain link fence and replace the fence upon completion of the project as shown on the Drawings.

1.02 RELATED SECTIONS

A. Section 01600 - Protection of Work and Property

B. Section 02940 - Removal of Temporary Construction and Site Restoration

C. Section 13270 - Supplemental Conditions for Earthwork

1.03 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS

A. American Society for Testing and Materials (ASTM)

1. ASTM A120 - Galvanizing

2. ASTM A392 - Chain Link Fence Fabric

3. ASTM F567 - Installation of Chain Link Fence

1.04 SUBMITTALS

A. Samples of fabric, wires, and ties and post sections if other than the pipe sections specified.

B. Drawings, showing details of fence height, size of post, rails, braces, gates and accessories.

C. Three (3) copies of the manufacturers' certification.

PART 2 MATERIALS

2.01 PRODUCTS

A. Posts, Rails, & Braces

1. Schedule 40, steel pipe, galvanized, in accordance with ASTM A120.

2. Dimensions and weights (minimum):

	Outside Dia. (In)	Weight/Ft. (lbs)
End, Corner & Pull Posts	2.875	5.79
Line Posts (heavy duty)	2.375	3.65
Top Rails & Braces	1.66	2.27
Gate Posts: leaves 6 ft wide or less	2.875	5.79
leaves over 6 ft including 13' wide	4.00	9.11

B. Chain Link Fabric

1. One piece 9 gauge fabric, 72" wide, 2" mesh galvanized after weaving in accordance with ASTM A392, Class 2.

C. Gates

1. Additional gates may be installed at the Contractor's request and expense. The location, size, and fabrication shall be submitted with a detail drawing for approval by the Engineer.

D. Miscellaneous

1. Concrete for footings shall be Class C (3000 psi).

2. Wire ties or clips shall be minimum of 6 gauge.

a. Hog rings may be used to tie fabric to tension wire.

PART 3 EXECUTION

3.01 GENERAL

A. Installation shall be in accordance with ASTM F567, Installation of Chain-Link Fence, unless otherwise modified.

3.02 POST INSTALLATION

A. Space line posts equidistant at intervals not exceeding 10 feet.

B. Post holes shall be of a diameter to provide not less than 4 inches of concrete outside the post and 3 inches below bottom of post.

C. Set plumb and to alignment in concrete base to a depth of:

1. 36" for line post

2. 42" for pull, corner and gate posts.

D. Crown concrete 2 inches above finish grade to shed water.

E. Concrete shall cure a minimum of 72 hours before further work is done on post.

3.03 BRACES

A. Provide at all end, gate and in both tangents at pull and corner posts.

3.04 TOP RAILS AND TENSION WIRE

A. Attach toprail securely to each gate, corner, pull and end posts.

1. Support at each intermediate post to form a continuous brace from end to end.

B. Bottom tension wire shall be taut and 6± inches above finished grade.

3.05 FABRIC

A. Tighten to provide a smooth uniform appearance free from sags.

B. Attach to terminal post using stretcher bars with tension bands at maximum 14 inch intervals or other approved method.

C. Install fabric 2 inches above finished grade.

D. Fasten to line post at intervals not exceeding 14 inches.

E. Fasten to top rail, braces, and tension wire at intervals not exceeding 24 inches.

3.06 COMPLETION

A. The area shall be left neat and free of any debris caused by the erection of the fence.

[END OF SECTION]

SECTION 02900

FERTILIZING AND SEEDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall furnish all labor, materials, tools, supervision, transportation, installation equipment, and incidentals required to apply fertilizer, to apply seed and mulch, and maintain specified herein all areas disturbed by the construction.

B. The work shall include fertilizing and seeding for the backfilled excavation, and restoration of all areas within the limits of construction disturbed by the Contractor during the work. All seeding shall be applied by hydroseeding, unless other methods are proposed by the Contractor and approved by the Engineer.

1.02 RELATED SECTIONS

A. Section 02110 - Clearing, Grubbing, and Topsoil Removal

B. Section 02931 - Dust, Erosion, and Sediment Control

C. Section 13270 - Supplemental Conditions for Earthwork

1.03 SUBMITTALS

A. At least two weeks prior to fertilizing and seeding activity, Contractor shall submit seed vendor's certified statement for the grass seed mixture required, stating common name, percentages by weight, percentages of purity, and germination. All seeds shall comply with the seed Law of the State of Mississippi and current regulations.

PART 2 - PRODUCTS

2.01 HYDROSEED MIXTURE

A. Hydroseed applied to soil shall conform to the following (or the Engineer approved equal):

Specia	% Purity	% By Weight	% Germination
Kentucky 31 Fescue	95	70	80
English Rye	95	20	80
White Clover	95	10	85

B. The seed shall be furnished and delivered premixed in the proportions specified above.

C. The material shall be delivered in packages of uniform weight and bear the name of the manufacturer, the net weight, and a supplemental statement of net weight content.

D. The material specified is for a seeding date of August 1 through December 1. If the seeding season changes, an alternate material will be specified by the Engineer.

2.02 FERTILIZER

A. Fertilizer shall be commercial stock, of neutral character, with elements derived from organic sources. On each bag shall be the manufacturer's guaranteed statement of analysis. It shall contain a minimum of 10 percent nitrogen, 10 percent phosphoric acid, and 10 percent potash. Fertilizers shall comply with the Fertilizer laws of the State of Mississippi.

2.03 MULCH

A. Mulch shall contain a binder material suitable for installation on steep slopes.

B. Mulch shall be air dried and free from noxious weeds and weed seeds or other materials detrimental to plant growth.

PART 3 EXECUTION

3.01 APPLICATION

A. Previously restored grades shall be maintained in a true and even condition.

B. The Contractor shall hydroseed only on a calm day, when wind velocity is less than 5 mph or as directed by the Engineer. No seeding shall be done on frozen ground or when the temperature is 32°F or lower. Schedules for seeding and fertilizing must be submitted to the Engineer for approval prior to the work. Seeding shall be done within ten days following soil preparation. Mulch materials shall be applied on seeded areas within 48 hours after seeding, if a seeding method other than a hydroseeding method is used.

C. Before seeding, all gullies, washes, or disturbed areas that develop subsequent to final dressing of cover soil shall be repaired. All areas shall be loosened by discing, harrowing, or other approved methods immediately prior to seeding. The cover soil shall be loosened to a depth of three inches.

D. In order to prevent unnecessary erosion of newly covered and graded slopes and unnecessary siltation of drainage ways, the Contractor shall carry out seeding and mulching as soon as a portion of the project has been satisfactorily completed and/or as directed by the Engineer. When protection of newly covered and graded areas is necessary, at a time which is outside the normal seeding seasons, the Contractor shall protect those areas by whatever means necessary, as approved by the Engineer, and shall be responsible for prevention of siltation in the areas beyond the limit of work.

E. Excessive amounts or bunching of mulch will not be permitted. Mulch shall be left in place and allowed to disintegrate and shall be anchored as required by a method approved by the Engineer. Anchorage or mulch which has not disintegrated at the time of first mowing shall be removed by the Contractor.

F. Following applications of mulch, the seed bed shall be moistened. A muddy soil condition will not be acceptable.

G. If necessary, erosion protection measures if to provide vegetation establishment shall be taken.

H. A stand of grass shall be defined as not less than 100 grass plants per square foot. The stand of grass resulting from the seeding shall not be considered satisfactory until accepted by the Engineer. In areas greater than one square foot which do not have a satisfactory stand of grass, mulch will be removed and the area shall be reseeded (or rehydroseeded) at the Contractor's expense.

3.03 MAINTENANCE AND ACCEPTANCE

A. The Contractor shall keep all seeded areas watered and in good condition, reseeding all seeded areas if and when necessary until a good, healthy, uniform growth is established over the entire area seeded, and shall maintain all seeded areas in an approved condition until the end of the maintenance period.

B. Maintenance Period

1. Maintenance period shall commence immediately after the placement of landscape materials.

2. Maintenance shall be continued for the period required to establish an acceptable growth, but for not less than 60 days after the date of substantial completion.

3. If seeding is not completed before November 15, 1994, maintenance shall be continued through the following spring season until an acceptable growth is established. Winter maintenance shall include protection of the completed Work, and immediate repair of all damage.

C. Maintenance shall include the following items:

1. Erosion channels, gullies, or other damage to all graded or covered surfaces will be stabilized by fill, and revegetated as specified herein.

2. Areas within covered or graded surfaces which experience subsidence or settling shall be filled, and revegetated as specified herein.

3. Seeded areas shall be mowed and raked, weeded, watered, fertilized, overseeded, remulched or otherwise maintained to establish an acceptable growth.

4. Seeded areas shall be mowed to a height of 2 inches whenever the average height of the grass reaches 3 inches.

[END OF SECTION]

SECTION 02931

DUST, EROSION, AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall furnish all labor, materials, tools, supervision, transportation, installation equipment, and incidentals required to provide dust erosion, and sediment control during and upon completion of construction as specified herein, and as necessary for a complete installation.

B. The work shall include temporary erosion and sediment control (i.e., until permanent erosion control features have been established) for those areas shown in the Soil Erosion and Sediment Control Plan and all areas disturbed by the Contractor. Work involves installation of silt fences, hay bales, erosion control and revegetation mats, etc.

C. Soil Erosion and Sediment Control Plan shall be developed for the project by the Contractor in accordance with the State of Mississippi Water Pollution Control Stormwater Construction General Permit Requirement and all other appropriate local, state, and federal regulations.

D. Dust control shall consist of operations performed by the Contractor to minimize the production of dust in the work areas and off-site.

1.02 RELATED SECTIONS

A. Section 01060 - Regulatory Requirements

B. Section 01600 - Protection of Work and Property

C. Section 02110 - Clearing, Grubbing, and Topsoil Removal.

D. Section 02900 - Fertilizing and Seeding

E. Section 13270 - Supplemental Conditions for Earthwork

1.03 SUBMITTALS

A. Contractor shall develop a Soil Erosion and Sediment Control Plan which complies with all

applicable State of Mississippi and local regulatory requirements. Contractor shall be responsible for all notices and permit approvals required from State of Mississippi and shall obtain such notices and approvals such that the project start date is not delayed. This Plan shall be approved by the Engineer prior to submittal to the MDEQ and before construction starts. Review and approval by the Engineer shall not releive Contractor of complying with all applicable regulatory requirements and obtaining the necessary regulatory approvals.

B. Submit product data on silt fence material and other erosion control products.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Silt fence fabric shall be woven.

1. Woven fabric shall consist of monofilaments of polypropylene treated with ultraviolet light stabilizers and shall weigh a minimum of 3.5 oz/sq yd.

2. Silt fence fabric shall be inert to chemicals commonly found in soils.

3. Silt fence fabric shall be resistant to mildew, rot, insects, and rodent attack.

4. Silt fence posts shall be constructed of wood and 2 inches square. Silt fence fabric shall conform to the following test criteria:

Geotextile Properties

Property	Test Method	Average Value
Grab Tensile, lbs.	ASTM-D-4632	110 x 90
Grab Elongation, %	ASTM-D-4632	15
Mullen Burst, psi	ASTM 3786	275
Puncture, lbs.	ASTM 3787 (modified)	30
Trapezoidal Tear, lbs.	ASTM-D-4533	50
U.V. Resistance, % (Strength Retained)	ASTM-D-4355	70
E.O.S.	CW02215	20/30
Permittivity, (1/sec)	ASTM-4491	.2
gal/min/sq. ft.		15

B. Straw bales shall consist of undecayed firmly-packed straw of nominal size 14 inches by 18 inches by 36 inches as prepared by any standard hay-bailing machine and firmly bound by at least two separate circuits of rope or band material which will withstand weathering for a minimum of three months.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Silt fences shall be installed as shown in the Soil Erosion and Sediment Control Plan by securely fastening silt fence fabric using wire ties. The silt fence fabric panels shall be installed loosely with adjacent panels overlapped a minimum of 12 inches. Silt fence material shall be embedded at least six inches beneath ground surface and shall extend upward at least two feet above the disturbed area ground surface. The top edge of the fabric shall be reinforced or shall have a one inch tuck.

B. Straw bales shall be installed as shown in the Soil Erosion and Sediment Control Plan in a row with ends tightly abutting. Each bale shall be embedded in the soil a minimum of four inches and placed so that the bale bindings are oriented horizontally. Bales shall be securely anchored in place by wood stakes, steel fence pickets, or rebars driven through the bale. Stakes shall be driven flush with the bale and shall extend at least 12 inches beneath the bale into the underlying soil.

C. Accumulated silt and debris shall be removed by the Contractor from behind the face of the silt fence as needed to provide proper silt fence operation. Clogged or damaged fabric shall be immediately replaced.

D. Accumulated silt and debris and damaged or deteriorated bales shall be removed by the Contractor. Deteriorated bales shall be replaced immediately by the Contractor.

3.02 PROVISIONS FOR EROSION CONTROL DURING CONSTRUCTION

A. The Contractor shall implement erosion control measures around all areas to be disturbed prior to disturbing ground in the area, to the satisfaction of the Engineer.

B. The Contractor shall take sufficient precautions during construction to minimize the run-off of polluting substances such as silt, clay, wastes, fuels, oils and bitumens into the water supplies and surface waters of the State. Special precautions shall be taken in the use of construction equipment to minimize erosion.

C. Temporary drainage ditches, silt fences, and other erosion and sediment control features shall be maintained in the locations shown in the Soil Erosion and Sediment Control Plan and at other incidental locations identified by the Owner or the Engineer.

E. As a minimum, the following shall apply:

1. Staked bales of hay or approved silt fencing shall be provided at points where drainage from the work site leaves the site, to reduce the sediment content of the water. Sufficient bales of hay or silt fence shall be provided such that all flow will filter through the hay or silt fence. Other methods which reduce the sediment content to an equal or greater degree may be used as approved by the Engineer.

2. Drainage leaving the site shall flow to water courses in a manner that minimizes erosion.

3. Drainage from the interior of the excavations as well as the processing area shall be treated as required by Section 13400 - Water Storage, Treatment, and Disposal.

3.03 DUST CONTROL

A. The Contractor shall implement dust control procedures (e.g., watering) to prevent conditions under which dust is visible in the air.

B. Contractor shall be responsible for maintaining site conditions such that no visible dust exists. In the event that the Owner or the Engineer requires dust control it shall immediately be implemented by the Contractor.

C. The Owner shall reserve the right to suspend the Work at any time if necessary due to excessive wind velocity or adverse wind direction.

D. Calcium chloride or other chemical methods shall not be used for dust control. Severe dust problems shall be controlled with mulch, gravel, or other temporary methods subject to the approval of the Engineer.

[END OF SECTION]

DIVISION 13 - SPECIAL CONSTRUCTION SERVICES

SECTION 13100

SOIL PROCESSING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance of Full-Scale Soil Processing Test (Full-Scale Test).

B. Performance of Full-Scale Soil Processing.

1.02 RELATED SECTIONS

A. Section 01600 - Protection of Work and Property

B. Section 02220 - Excavation

C. Section 02931 - Dust, Erosion, and Sediment Control

D. Section 13200 - Soil Cell Treatment

E. Section 13270 - Supplmental Conditions for Earthwork

1.03 DEFINITIONS

A. Aggregate: Inert material of mineral grains such as sand and gravel or combinations thereof.

B. Batch Time: The actual residence time of the soil and aggregate in the mixer.

C. Mixer: Equipment that is used for processing or blending the soil and aggregate.

D. Processing: The process by which off site aggregate is mixed with excavated site soil to produce a homogeneous mix of aggregate and soil.

E. Processing Area: The site area designated on the Engineer approved Contractor Full-Scale Soil Processing Work Plan to be used for stockpiling, processing, and treating soil, and other necessary unit operations.

F. Processed Soil: Material consisting of off-site aggregate and excavated site soil that has been mixed together.

G. Soil: Material consisting of mineral grains and organic matter (solid particles).

H. Target Concentration Limit: 7.8 mg/kg of Trichloroethene (TCE) in soil as measured using EPA SW-846 Method 8010 or 8240 and corrected to account for soil amendment.

I. Treated Soil: Soil that meets the target concentration limit after being processed or after further ex-situ vapor extraction treatment in a soil cell.

1.04 PROCESS DESCRIPTION AND OBJECTIVES

A. Process Requirements and Information

1. Processing soil with concentrations above the target concentration limit through a separation process to remove oversized rocks, concrete, scrap metal, and other debris; then through a mixer with the addition of aggregate to increase the porosity and facilitate vapor stripping of the volatile organic constituents.

2. Reduce the concentration in the excavated soil as much as practicable by the mixing process to minimize or eliminate the necessity for further treatment.

3. Soil that cannot feasibly be stripped of the volatile organic constituents by processing shall be treated by ex-situ vapor extraction in a soil cell as specified in Section 13200 - Soil Cell Treatment.

4. Control of air emissions generated in the soil processing area by collecting air during soil processing (mixing) and treating such emissions prior to release.

1.05 SUBMITTALS

A. Phase 1 - Full-Scale Test Work Plan

1. Work Plan shall include scaled drawing(s) indicating site area requirements and layout of all processing facility equipment, spatial requirements, material handling requirements, and plan, sections, and details of environmentally protection and containment system for mixing process area.

2. Work Plan shall describe the mixing process, method of operation, mobilization/ demobilization plan and procedures, and methods to be used to assure related technical requirements of specifications are met (i.e., erosion and sediment control, stormwater diversion, water treatment, control of fugitive emissions, etc.).

3. The Work Plan shall include an Emissions Control Plan for controlling emissions from the mixing operations. The Plan shall describe the operation of the emission control system, include all equipment specifications, and disposal of residual waste material. The Plan shall describe how emission control measures will minimize the discharge of volatile organic constituents and meet the appropriate local, state, and federal air quality laws and regulations.

4. Following completion of the Full-Scale Soil Processing Test Work Plan by the Contractor, the Engineer will indicate to Contractor the location and method of soil sample collection to be used by Engineer. Contractor shall cooperate with Engineer to allow soil sample collection. The Engineer will analyze samples on site using analytical equipment located in the Field Office.

5. Based on the Full-Scale Test results and analytical data provided to the Contractor evaluation of the soil/aggregate ratio and batch time(s) will be recommended by the Contractor and submitted to the Engineer for approval.

6. Contractor shall provide Engineer with report stating recommendations on optimum equipment operation, ability to mix materials, emissions control capability, etc.

C. Phase 2 - Full-Scale Treatment Work Plan

1. Contractor shall prepare a Work Plan presenting mobilization and demobilization plan and procedures, emission control plan, including site drawing (to scale), processing facilities plan, haul roads plan, and auxiliary site needs (as called for elsewhere in these Project Specifications) for the full-scale soil processing. Contractor shall provide appropriate cross-sections and details of

proposed construction to allow Engineer review of proposed construction.

PART 2 - EQUIPMENT

2.01 Screen

A. The soil to be processed may contain oversized objects that can not be mixed or will plug the mixer. These materials include but are not limited to rocks, construction debris, and scrap metal. Oversize material shall be appropriately screened out prior to mixing and stockpiled.

2.02 Mixer

A. The mixing equipment shall provide for a complete mix of the aggregate into the soil to create a homogeneous mixture. The rate of processing shall be determined based on the results of the Full-Scale Test. An approved mixing device is a 3 cubic yard or larger pug mill. Other mixing devices may be approved by the Engineer.

2.03 Air Emissions Control

A. Air emissions control shall be provided. Fugitive emissions from the mixing equipment shall be collected and treated thereby minimizing the release of vapors containing site constituents. At a minimum, two air volume changeovers per minute within the mixer shall be maintained.

B. Air emissions control system shall provide appropriate dust and water removal, and final treatment through activated carbon. Treatment through granular activated carbon shall consist of at least two carbon vessels installed in series. Sufficient redundancy of equipment shall be provided such that equipment failures or maintenance will not prevent the continued operation of the system during normal working hours.

C. Contractor shall coordinate air emissions control system operation with Engineer to allow sampling for treatment efficiency evaluation.

PART 3 EXECUTION

3.01 Processing Soil

A. Contaminated soil shall be hauled from the excavation and stockpiled within a containment system that will protect the underlying environment from contamination. The amount of contaminated soil excavated and stockpiled shall be sufficient to provide for continuous processing of soil. All contaminated soil and processed soil shall be covered when work is not in progress.

B. The soil excavated for processing shall be processed using the mix ratio selected based on the Full-Scale Soil Processing Test, as specified in part 3 of this section. The determined mix ratio and batch time(s) will be used for the remaining portion of the project. Contractor shall coordinate operation with Engineer observation. If varying soil conditions are observed Contractor shall vary aggregate mix and mix time as requested by the Engineer. Contractor price will be adjusted based on unit prices given for aggregate and batch time by Contractor in Bid.

C. Emissions from the mixer shall be controlled as specified in Engineer approved Contractor Work Plan.

3.02 Sampling and Analysis

A. The Engineer will conduct sampling and analysis of the soil during processing as specified in Part 3 of this section.

PART 4 PHASES OF IMPLEMENTATION

4.01 Phase 1 - Full-Scale Soil Processing Test

A. The Contractor shall process approximately 200 cubic yards (refers to in-place volume) of selected contaminated soil using the material sources, equipment, and operating conditions intended for the full-scale operation. The contaminated soil shall be excavated from the area of Excavation B indicated on the Drawings. It is intended that soil be excavated such that individual tests can be conducted on soil with high, medium, and low concentrations of TCE. It is intended that soil volumes with low, medium, and high TCE concentrations contain less than 50 mg/kg, 50 to 100 mg/kg, and greater than 100 mg/kg,

respectively. The Engineer will take soil samples to determine the location and depth at which soils will be excavated. Soil sampling results and directions to Contractor for sample removal for full-scale test will be provided within 48 hours after initial sample taken.

B. Engineer will obtain soil samples immediately before and after processing to analyze for TCE and moisture content according to the following table.

TEST MATRIX FOR
SOIL WITH LOW TRICHLOROETHENE CONCENTRATION
(< 50 mg/kg)

Soil/Pre-mixed Aggregate Ratio[a]	Number of Batch Tests[b]		
	2 Minute Batch Time	6 Minute Batch Time	10 Minute Batch Time
100/0	1	1	1
90/10	1	1	1
80/20	1	1	1
70/30	1	1	1

TEST MATRIX FOR
SOIL WITH MEDIUM TRICHLOROETHENE CONCENTRATION
(50 TO 100 mg/kg)

Soil/Pre-mixed Aggregate Ratio[a]	Number of Batch Test[b]		
	2 Minute Batch Time	6 Minute Batch Time	10 Minute Batch Time
100/0	1	1	1
90/10	1	1	1
80/20	1	1	1
70/30	1	1	1

TEST MATRIX FOR
SOIL WITH HIGH TRICHLOROETHENE CONCENTRATION
(100 mg/kg or greater)

Soil/Pre-mixed Aggregate Ratio[a]	Number of Batch Tests[b]		
	2 Minute Batch Time	6 Minute Batch Time	10 Minute Batch Time
100/0	1	1	1
90/10	1	1	1
80/20	1	1	1
70/30	1	1	1

ADDITIONAL TEST MATRIX TO BE CONDUCTED
USING HIGH TRICHLOROETHENE CONCENTRATION

Soil/Aggregate Ratio[c]	Number of Batch Tests[b]		
	2 Minute Batch Time	6 Minute Batch Time	10 Minute Batch Time
Ratio 1	1	1	1
Ratio 2	1	1	1
Ratio 3	1	1	1
Ratio 4	1	1	1

[a]Indicates ratio in percent of contaminated soil to be mixed with the pre-mixed aggregate. Pre-mixed aggregate must meet the gradation presented in Section 13270 - Supplemental Conditions for Earthwork.

[b]Each batch test shall consist of one complete charge to mixing unit exactly as it would be performed during full-scale processing.

[c]Indicates ratio in percent of contaminated soil to be mixed with gravel, sand or pre-mixed aggregate. Ratios will be based on the results of previous tests.

C. The Contractor shall process soils representing the three different concentration ranges at the batch times and different ratios of soil/aggregate as indicated in above table.

D. The Contractor shall provide the desired aggregate as specified in Section 13270.

E. Processed soil shall be placed in separate piles on a containment system to protect the underlying soil from contamination. The separate piles shall be labeled with the mix ratio and batch time and covered.

F. The Contractor shall provide one week stand by time to accomodate Engineer evaluation of data and decision on full-scale processing parameters.

G. The Contractor shall have one week to make appropriate changes to the Work Plans and request changes to the Contract as necessary based on the results of the Full-Scale Test Report.

4.02 Phase 2 - Full-Scale Soil Processing

A. The Contractor shall process the remaining volume of contaminated soil using the selected aggregate material, mix ratio, and batch time(s). The batch time, aggregate, and mix ratio recommended by the Contractor and approved by the Engineer shall be used for full-scale processing. However, Contractor may be requested by Engineer to make adjustments in process variables due to soil variability. Contract adjustments for batch time and aggregate quantity requested by Engineer and will be based on Contractor unit prices provided in Bid.

B. Contractor will coordinate with Engineer to facilitate sampling of material during full-scale soil processing.

C. It is anticipated that a composite sample will be collected from a stockpile generated during one day of processing. The analytical results from the sample will be made available to the Contractor within 24 hours of sample collection. Once the results are known the Contractor may move the daily stockpiled soil to one of two larger stockpiles. One stockpile will consist of soil meeting the target concentration limit and another stockpile will consist of soil not meeting the target concentration limit which requires additional processing or soil cell treatment.

D. Soil that meets the target concentration limit shall be stockpiled until the excavation has proceeded enough to allow backfilling without interfering with the soil remaining to be excavated. A sufficient buffer zone between active excavation work and backfilling shall be maintained to allow Engineer sampling of completed excavation.

Excavation and backfill must also be conducted to allow Contractor surveying of excavation for the preparation of as-built excavation drawings. Contractor surveying shall be coordinated with Engineer to allow Engineer spot-checking of survey.

E. The Contractor shall plan soil processing work to provide for uninterrupted work on the project. Demobilization and remobilization of any equipment (e.g., the mixing unit, excavation equipment, etc.) will be done at the Contractor's expense and shall not cause any project delays.

[END OF SECTION]

SECTION 13200

SOIL CELL TREATMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance of Processed Soil Placement.

B. Performance of Soil Cell Operation.

1.02 RELATED SECTIONS

A. Section 01600 - Protection of Work and Property

B. Section 02220 - Excavation and Subgrade Preparation

C. Section 02931 - Dust and Erosion Control

D. Section 02940 - Removal of Temporary Construction and Site Restoration

E. Section 13100 - Soil Processing

F. Section 02200 - Earthwork

1.03 SUBMITTALS

A. Contractor shall provide a submittal depicting the soil cell configuration to scale and a description of soil placement methods. Submittal shall include all plans, cross-sections, and details, to scale of soil cell and ancillary facilities. The submittal shall include a complete description and scaled layout of all components of the soil cell including soil cell base, cover, piping systems, air emission controls, etc. The Contractor shall include in the submittal a complete description for the operation of the soil cell.

PART 2 MATERIALS

2.01 PIPING AND FITTINGS

A. Pipe and fittings shall be Schedule 40 polyvinyl chloride which meets or exceeds the requirements of Cell Classification 12454-B polyvinyl chloride as outlined in ASTM D1784.

B. Standard pipe shall be as prescribed by ASTM D1785 and ASTM D2466 for pressure rated piping systems and suitable for vacuum service. Perforated pipe

shall have two rows of 1/2 inch diameter holes on 5 inch centers as specified in ASTM D2729. The perforated pipe shall be wrapped in geotextile fabric as specified in Section 13260.

2.02 VALVES

A. Valves suitable for air throttling shall be provided.

2.03 VACUUM GAUGES

A. Two sets of vacuum gauges shall be provided by the Contractor, one set for use by the Engineer and the other set for use by the Contractor. Each set of vacuum gauges shall have one gauge with a vacuum range from 0 to 30 inches w.c. and the other gauge from 0 to 100 inches w.c. The gauges shall have a minimum $\pm$1 percent accuracy with a 2-1/2 dial.

B. Quick disconnects shall be used to connect the vacuum gauges to the piping system to allow the vacuum at various points in the piping system to be monitored as shown on the Drawings.

2.04 VAPOR EXTRACTION EQUIPMENT AND EMISSION CONTROL

A. The vapor extraction equipment shall provide enough vacuum and the distribution system designed so that all portions of all pipes are under a similiar vacuum. The capacity of the equipment shall be sufficient to provide a minimum of five air changes (by volume) per day within the soil cell.

B. Air emissions control system shall provide appropriate dust and water removal, and final treatment through granular activated carbon. Treatment through activated carbon shall consist of at least two carbon vessels installed in series. Sufficient redundancy of equipment shall be provided such that equipment failures or maintenance will not prevent the continued operation of the system.

PART 3 EXECUTION

3.01 PLACEMENT OF SOIL

A. The purpose of mixing the contaminated soil with aggregate is to increase the porosity of the contaminated soil to provide for efficient vapor stripping. Placement of processed soil into a soil stockpile prior to the cell and into the soil cell

shall be done in a manner which minimizes compaction of the soil. Heavy equipment shall not be permitted on the soil during placement into the processed soil stockpile or soil cell. Heavy equipment will be permitted on the soil only during the retrieval of treated soil for placement back into the excavation.

3.02 PLACEMENT OF PIPING AND TOP LINER

A. General piping placement shall be as specified and as shown in the Drawings. Modification may be allowed as necessary to increase the overall length of the soil cell, but not the width of the soil cell.

B. The perforated piping shall be placed at a 3 and 5 foot soil depth above the drainage layer. The perforated pipe shall be connected to a 4 inch diameter solid pipe at each end so that the perforated pipe is approximately 4 feet from the outer edge of the soil cell. A solid pipe or approved flexible solid pipe shall be fitted to follow the contours of the cell and berm to exit the cell between the geomembrane layers. Alternative methods of pipe exit may be approved by the Engineer.

C. Each end of the pipe exiting the soil cell shall have quick disconnect fittings for connection of vacuum gauges.

D. The pipes exiting the cell on one side shall be connected to the manifold pipe going to the blower. Each pipe exiting the soil cell, connected to the manifold shall have a throttling valve installed to control the flow. Each pipe exiting the soil cell on the opposite side shall have a removable cap to allow air to enter the cell, as desired.

E. The processed soil stockpile and the soil cell shall be covered with the top liner to prevent infiltration of precipitation and minimize release of fugitive VOC emissions.

F. The liner shall be removed only when necessary to place or remove soil. The liner shall be secured at the end of each day. The liner shall be secured by placement of sand bags at ten-foot intervals at the base, along sides, and on top of the piles. A rope shall be tied to each sand bag and connected to the next sand bag. Sand bags shall be sized to hold the cover system in place. Should cover be affected by wind or other weather related elements

and be damaged Contactor shall repair immendately at no cost to the Owner.

3.04 OPERATION OF SOIL CELL

A. The Contractor shall be responsible for daily operation of the soil cell, including vapor extraction and treatment until the project is completed.

B. At a minimum the following items shall be conducted and recorded on daily log sheets: confirm proper operation of blower, check and drain water condensate from water knock out chamber, check and pump water from drainage layer sumps, record vacuum gauge readings at each end of every pipe, sample and record VOC concentration from each extraction pipe (using organic vapor analyzer (OVA)), adjust valves appropriately based on monitoring information, and conduct all other items for a complete operation of the soil cell.

C. Ponded water on the liner, if any, shall not be allowed to contact contaminated soil and shall be removed immediately following a precipitation event.

D. Water from the drainage layer shall be regularly pumped out and treated as specified in Section 13400 - Water Storage, Treatment, and Disposal.

3.05 SAMPLING AND ANALYSIS

A. Contractor shall coordinate operation of soil cell to allow sampling by the Engineer.

B. Based on Contractor's plan for construction and operation of the soil cell, the Engineer will collect composite samples to characterize appropriate sections of the soil cell. Samples will be collected when the air monitoring indicates that the soil may meet the target concentration limit. The analytical results from the sample will be made available to the Contractor within 48 hours of sample collection. Soil that meets the target concentration limit, based on the analytical results, shall be backfilled into the excavation or stockpiled, if necessary, in an approved area within the Project Limits of Work.

[END OF SECTION]

SECTION 13250

SUPPLEMENTAL CONDITIONS FOR GEOMEMBRANE LINER USE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This specification applies specifically to the use of a geomembrane in the subgrade construction for the mixing area, soil cell, and ancillary facilities. This specification sets forth the standards required for the use of the geomembrane but is not intended to relieve the Contractor of any performance requirements set forth under Sections 13100 and 13200. The Contractor shall furnish all labor, materials, tools, supervision, transportation, testing, and installation equipment to install the geomembrane liner as necessary for a complete installation.

B. The work shall include the geomembrane liner included as part of the containment system for the processed soil stockpile, soil cell liner and cover, and mixing area and the cover for same.

1.02 RELATED SECTIONS

A. Section 01400 - Construction Quality Control

B. Section 01600 - Protection of Work and Property

C. Section 02220 - Excavation

D. Section 13100 - Soil Processing

E. Section 13200 - Soil Cell Treatment

F. Section 13260 - Supplemental Conditions for Geotextile Use

1.03 REFERENCES

A. National Sanitation Foundation (NSF) Standard 54, "Flexible Membrane Liners," revised May 1991.

B. Latest version of the American Society for Testing and Materials (ASTM) standards:

1. ASTM D413 - Rubber Property-Adhesion to Flexible Substrate

2. ASTM D570 - Test Method for Water Absorption of Plastics

3. ASTM D638 - Tensile Properties of Plastics

4. ASTM D751 - Coated Fabrics

5. ASTM D1004 - Initial Tear Resistance of Plastic Film and Sheeting

6. ASTM D1203 Test Methods for Volatile Loss from Plastics using Activiated Carbon Methods

7. ASTM D1505 - Density of Plastics by the Density-Gradient Technique

8. ASTM D3083 - Specification for Flexible Poly (vinyl chloride) Plastic Sheeting for Pond, Canal, and Reservoir Lining

9. ASTM D4833 - Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

1.04 QUALIFICATIONS

A. The Contractor will contract the Geomembrane Installer, as a Subcontractor, if the Contractor is not a qualified installer.

B. The Contractor shall accept and retain full responsibility for installation and shall be responsible for any defects in the completed work.

C. The Contractor shall be responsible for coordination of geomembrane installation with earthwork activities.

D. The Contractor shall be responsible for field handling, storing, deploying, seaming, temporarily restraining (against wind), and other site aspects of the materials and other components of the system.

E. The Contractor shall submit to the Engineer in writing the following information:

1. A list of at least five completed facilities for which the Contractor has successfully installed HDPE lining materials. The following information shall be provided for each facility.

a. the name and purpose of the facility, its location, and dates of installation;

b. the names of the Owner, Project Manager, Engineer, General Contractor, Geomembrane Manufacturer and/or Fabricator, and the name of a contact at the facility who can discuss the project;

c. thickness and surface area of installed geosynthetic material; and

d. type of seaming and type of seaming apparatus used.

2. All personnel performing seaming operations shall be qualified by experience or by successfully passing seaming tests.

1.05 WARRANTY

A. The Manufacturer shall confirm in writing, prior to shipment, that the material to be furnished will meet the intent of the specifications, and shall guarantee the material to be free of defects in materials and workmanship at the time of sale and against deterioration due to the effects of ozone, ultraviolet, or other normal weathering for the duration of this project.

1.06 SUBMITTALS

A. Prior to transporting any materials to the site, the Contractor shall obtain from the Manufacturer and/or Fabricator, and have available for the Engineer's inspection, the following documentation on the geomembrane.

1. Copies of quality control certificates issued by the Manufacturer and/or Fabricator, including the production dates and materials used to manufacture the materials for the project.

2. Results of tests conducted by the Manufacturer and/or Fabricator to verify the quality of the materials rolls assigned to the project and the quality control certificates issued by the Manufacturer and/or Fabricator.

B. The Contractor will obtain from the Manufacturer and/or Fabricator, and have available for the Engineer's inspection, the following documentation

on geomembrane materials roll production prior to the shipment of the geomembrane rolls.

1. Manufacturing certificates for each shift's production of materials, signed by responsible parties employed by the Manufacturer (such as the production manager), and notarized.

2. The quality control certificate shall include:

   a. roll numbers and identification;

   b. sampling procedures; and

   c. Results of quality control tests, including description of the test methods used.

3. The Manufacturer quality control tests to be performed, as specified in this Section.

C. Prior to commencement of the installation, the Contractor shall submit to the Engineer:

1. A panel drawing for the HDPE geomembrane showing the installation layout identifying field seams as well as any variance or additional details. The panel layout shall be adequate for use as a construction plan and shall include dimensions and details.

2. Installation schedule.

D. During the installation, the Contractor shall be responsible for the timely submission to the Engineer of the quality control documentation.

E. A Certificate of Calibration less than 12 months old shall be submitted for the field tensiometer.

1.07 CONSTRUCTION QUALITY ASSURANCE

A. The installation of the geomembrane shall be monitored by the Engineer as outlined herein.

B. The Contractor shall be responsible for the testing activities outlined herein and shall account for these testing activities in the installation schedule.

1.08 ACCEPTABLE MANUFACTURERS

A. Liner - National Seal Company, Galesburg, IL - minimum 40 mil HDPE

B. Cover - Raven Industries, Sioux Falls, SD - minimum 12 mil MDPE fiber-reinforced

C. Approved Equal

PART 2 MATERIALS

2.01 GEOMEMBRANES

A. The geomembrane shall be high-quality product designed and manufactured for industrial applications.

B. The geomembrane material shall be manufactured from domestic virgin resins and specifically manufactured for use in hydraulic facilities. Reground or reprocessed material shall not be used. The material shall be uniform in color and produced in standard calendar widths.

C. The Contractor shall provide at a minimum 40 mil geomembrane for the liner. The liner shall have properties that comply with the following property values.

Property	Test Method	Value
Gauge (nominal)	---	40
Thickness (mils), minimum	ASTM D751, NSF Mod.	38
Density (g/cm^2), minimum	ASTM 1505	0.940
Tensile Properties, minimum (each direction)	ASTM D638	
1. Stress at Yield, lb/in width		2,200
2. Stress at Break, lb/in width		3,800
3. Elongation at Yield, %		13
4. Elongation at Break, %		700
Puncture Resistance (lbs), minimum	ASTM D4833	72
Tear Resistance (lbs), minimum	ASTM D1004	30
Water Absorption (% loss), maximum	ASTM D570 (at 23°C)	0.10
Volatile Loss (% loss), maximum	ASTM D1203 (Method A)	0.10
Resistance to Soil Burial (% change in original value), maximum	ASTM D3083 NSF Mod.	10

Hydrostatic Resistance (psi), minimum	ASTM D751 (Method A)	300

D. The Contractor shall provide at a minimum 12 mil MDPE fiber-reinforced cover. The geomembrane shall be a laminated product with a lino scrim reinforcement, sandwiched between two sheets of polyethylene. The lino scrim shall be a system of interwoven ribbons that are tied together where the ribbons intersect. The cover shall have properties that comply with the following values.

Property	**Test Method**	**Value**
Gauge (nominal)	---	12 mil
Weight per MSF, (lbs), average	--	50
Tensile Strength (lb/in), width), average	ASTM D751	3,000
Elongation (%), average	--	70
Grab Tensile (lbs), average	ASTM D751	83
Tongue Tear (lbs), average	ASTM D751	27
Trapezoid Tear (lbs), average	ASTM D751	46
Hydrostatic Bursting Point (lb/in), average	ASTM D751	90

E. Certified test results from the Manufacturer and/or Fabricator on the stock of material to be delivered to the site showing the minimum acceptable and actual test values for the physical characteristics of the geomembrane material shall be submitted to the Engineer at least two weeks prior to the start of installation of the geomembrane.

F. Labeling:

1. Geomembrane rolls shall be labeled with the following information:

   a. thickness of the material;
   b. name of Geomembrane Manufacturer and/or Fabricator
   c. directions to unroll or unfold the material;

d. product identification;
e. lot number; and
f. roll number.

G. Transportation:

2. Transportation of the geomembrane shall be the responsibility of the Contractor. The Contractor shall be liable for damage to the materials incurred prior to and during transportation to the site.

H. Handling and Storage:

1. All on-site storage and handling procedures shall be in strict accordance with the Manufacturer's recommendations and approved by the Engineer.

2. Handling, storage, and care of the geomembrane prior to and following installation at the site shall be the responsibility of the Contractor. The Contractor shall be liable for all damage incurred to the materials.

PART 3 EXECUTION

3.01 GENERAL

A. Prior to implementing any of the work in this Section, the Contractor shall carefully inspect the installed work of all other Sections and verify that all work is complete to the point where the work of this Section may properly commence without adverse impact.

B. The Contractor shall install the geomembrane during daylight hours.

C. Contractor is responsible for the integrity of liner system and cover throughout the duration of the project. If either fail in any way, Contractor is responsible for repair and any resulting environmental impact. Contractor must take all precautions to prevent damage to the liner including routine and proper withdrawal of liquids from sump, maintaining proper cover, proper equipment operation over liner, etc. Improper operation shall be cause for Engineer to require immediate inspection of liner at the Contractor's cost. Determination by Engineer that improper operation may have resulted in liner failure will be cause for soil sampling beneath liner by

Engineer and remediation, if necessary, by Contractor.

3.02 EARTHWORK

A. Surface Preparation:

1. Special care shall be taken to maintain the prepared soil surface. Any damage to the soil surface caused by installation activities shall be repaired by the Contractor at no cost to the Owner.

2. The liner shall not be placed onto an area which has been softened by precipitation or which has cracked due to desiccation.

3.03 40 MIL HDPE GEOMEMBRANE INSTALLATION (LINER)

A. General

1. Field Panel Identification:

a. A geomembrane field panel is a roll or a portion of roll cut in the field.

b. Each field panel must be given an identification code/number.

2. Field Panel Placement:

a. Field panels shall be installed as approved or modified at the location and positions indicated in the Drawings.

b. Field panels shall be placed one at a time, and each field panel shall be seamed by the end of each day.

c. Geomembranes shall not be placed when the ambient temperature is below 40°F or above 104°F.

d. Geomembranes shall not be placed during any precipitation, in the presence of excessive moisture (e.g., fog, dew), in an area of ponded water, or in the presence of excessive winds.

e. The Contractor shall employ placement methods which ensure that:

i. No vehicular traffic shall be allowed on the geomembrane until drainage layer is installed.

ii. Equipment used shall not damage the geomembrane by handling, trafficking, leakage of hydrocarbons, or other means.

iii. Personnel working on the geomembrane shall not smoke, wear damaging shoes, or engage in other activities which could damage the geomembrane.

iv. The method used to unroll/unfold the panels shall not scratch or crimp the geomembrane and shall not damage the supporting soil.

v. The prepared surface underlying the geomembrane shall not be allowed to deteriorate after prepared, and shall remain acceptable up to the time of geomembrane placement.

vi. The method used to place the panels shall minimize wrinkles (especially differential wrinkles between adjacent panels).

vii. Temporary loads and/or anchors (e.g., sand bags) not likely to damage the geomembrane, shall be placed on the geomembrane to prevent uplift by wind (in high winds, continuous loading is recommended along panel edges to minimize the risk of wind flow under the panels).

viii. The geomembrane shall be especially protected from damage in heavily trafficked areas.

f. Any field panel or portion thereof which becomes seriously damaged (torn, twisted, or crimped) shall be replaced with new material at no cost to the Owner. Less serious damage may be repaired at the Engineer's option and at no cost to the Owner. Damaged panels or portions of damaged panels which have been rejected shall be removed from the work area.

B. Field Seaming:

1. Seam Layout:

a. In general, seams shall be oriented parallel to the line of maximum slope, i.e., oriented down, not across the slope. In corners and at odd-shaped geometric locations, the number of field seams shall be minimized. No seams shall be located in an area of potential stress concentration.

2. Weather Conditions for Seaming:

a. Unless authorized in writing by the Engineer, seaming shall not be attempted at ambient temperatures below 40°F or above 104°F. The geomembrane shall be dry and protected from wind damage.

3. Field Seaming Process:

a. A field seaming method using a double fusion weld, extrusion, or other method as recommended by the Manufacturer and approved by the Engineer shall be used to seal the joint between factory sheets. The contact surface of the sheets shall be wiped clean to remove all dirt, dust, moisture, or other foreign materials. Any wrinkles shall be smoothed out prior to seaming. The Contractor shall ensure that the seams meet the required specifications as follows:

Property	Test Method	Value	
		Extrusion	Fusion
Shear Test (lb/in width), minimum	ASTM D638	86	86
Peal Test (lb/in width), minimum	ASTM D413	48	67

b. Individual panels of geomembrane materials shall be laid out and overlapped by a minimum of 4 inches prior to welding. All sheets shall be bonded together by means of extrusion welding or fusion welding or as recommended by the manufacturer.

c. The extrusion welding and the fusion welding apparatus shall be equipped with gauges giving the applicable temperatures. The

fusion welding apparatus must be an automated vehicular mounted device which produces a double seam with an enclosed space.

d. No "fish mouths" shall be allowed within the seam area. Where "fish mouths" occur, the material shall be cut, overlapped, and an overlap bonded seam shall be applied.

e. Any necessary repairs to the geomembrane shall be patched with a piece of the geomembrane itself. The patch shall extend at least 6 inches beyond the edge of the defect and all corners shall be rounded with a radius of approximately 3 inches.

f. Any geomembrane surfaces showing injury due to scuffing, penetration by foreign objects, or distress from other causes, shall, as directed by Engineer, be replaced or repaired with an additional piece of geomembrane of the proper size at no additional cost.

g. All field seams upon completion of work shall be tightly bonded. The Contractor shall test the continuity of seams by a physical non-destructive method, as described below. Any seams that fail shall be resealed and retested until they pass. This testing and reworking of unacceptable seams shall be at no additional cost to the Owner.

h. The Contractor shall provide the Engineer with seam samples if requested.

D. Non-Destructive Testing:

1. The integrity of all field seams shall be demonstrated by using a vacuum test unit, air pressure testing, or other methods recommended by the Manufacturer and approved by the Engineer.

a. Vacuum box testing can be used for the entire length of field seams. Any imperfections in the seams indicated by the vacuum box shall be repaired.

b. A double fusion weld shall be tested by a pressure test. The maximum permissible pressure differential after five minutes is 4 psi. Any imperfections in the seam shall be repaired.

2. Upon completion of the field seam testing, the Contractor shall provide written certification that all seams have been tested by the approved method and that the seams have been found to be secure and leak-free.

E. Defects and Repairs:

1. The geomembrane will be inspected before and after seaming for evidence of defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. The surface of the geomembrane shall be clean at the time of inspection. The geomembrane surface shall be swept or wiped by the Contractor if surface contamination inhibits inspections. The Contractor shall ensure that an inspection of the geomembrane precedes any seaming of that Section.

2. Each suspect location, both in seam and non-seam areas, shall be nondestructively tested using the methods described in Part 3.03D of this Section, as appropriate. Each location which fails nondestructive testing shall be marked by the Engineer and repaired by the Contractor.

3. When seaming of a geomembrane is completed (or when seaming of a large area of a geomembrane is completed) and prior to placing overlying materials, the Engineer shall identify all excessive geomembrane wrinkles. The Installer shall cut and reseam all wrinkles so identified. The seams thus produced shall be tested like any other seams.

4. Repair Verification:

a. Each repair shall be numbered and logged and shall be nondestructively tested using the methods described in Part 3.03D of this Section, as appropriate by Contractor. Repairs which pass the nondestructive test shall be taken as an indication of an adequate repair. Failed tests will require the repair to be redone and retested until a passing test results.

F. The Contractor shall be responsible to take all necessary non-destructive testing and if necessary destructive tests to his satisfaction to insure the installation and integrity of the installed liner.

G. Materials in Contact with the Liner:

1. The Contractor shall take all necessary precautions to ensure that the geomembrane is not damaged during work related to this project or by other construction activities.

3.04 12 MIL MDPE REINFORCED SOIL CELL COVER

A. General

1. The cover shall be manufactured at the factory to the required size to cover the soil cell and the processed soil stockpile in as few sheets as possible. If more than one sheet is required, the sheets shall be overlapped a minimum of 4 feet and properly weighted or anchored such that membrane will remain in proper position. Weighting and seaming shall be conducted such that operation of soil cell is not affected.

2. The cover shall be placed and removed from the soil cell and processed soil stockpile without damage to the cover. Damage to the cover shall be repaired by the Contractor at the Contractor's own expense.

[END OF SECTION]

SECTION 13260

SUPPLEMENTAL CONDITIONS FOR GEOTEXTILE USE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This specification applies specially to the use of a geotextile in the subgrade construction for the mixing area, soil cell, and ancillary facilities. This specification sets forth the standards required for the use of the geotextile but is not intended to relieve the Contractor of any performance requirements set forth under Sections 13100 and 13200. The Contractor shall provide all labor, materials, tools, supervision, transportation, and equipment as necessary for the installation of the geotextile as specified herein, as shown on the Drawings, and as necessary for a complete installation.

B. Included in this section are the geotextiles around perforated pipes and in the liner system (above the drainage layer) in the processed soil stockpile, soil cell, and mixing area and Haul Road as appropriate.

1.02 RELATED SECTIONS

A. Section 01600 - Protection of Work and Property

B. Section 02220 - Excavation

C. Section 13100 - Soil Processing

D. Section 13200 - Soil Cell Treatment

E. Section 13250 - Supplmental Conditions for Geomembrane Liner Use

F. Section 13270 - Supplemental Conditions for Earthwork

1.03 REFERENCES

A. Latest Version of the American Society for Testing and Materials (ASTM) Standards:

1. ASTM D1777 - Method for Measuring Thickness of Textile Materials

2. ASTM D3776 - Test Methods for Mass Per Unit Area (Weight) of Woven Fabric

3. ASTM D3786 - Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics: Diaphragm Bursting Strength Tester Method

4. ASTM D4355 - Standard Test Methods for Deterioration of Geotextiles from Exposure to Ultraviolet Light

5. ASTM D4491 - Water Permeability of Geotextiles by Permittivity

6. ASTM D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles

7. ASTM-4632 - Standard Test Method for Breaking Load and Elongation of Geotextiles (Grab Method)

8. D4751 - Standard Test Method of Determining Apparent Opening Size of Geotextiles

9. D4833 - Index Puncture Resistance of Geotextiles

1.04 SUBMITTALS

A. The Contractor shall select the appropriate geotextile for the specific application. The Contractor shall submit data for approval by the Engineer for the geotextiles to be used for the various applications. At a minimum, the following property values shall be submitted, along with a description of the intended geotextile use for each application.

Fabric Property	Test Method
Fabric Weight	ASTM D3776
Thickness	ASTM D1777
Grab Tensile Strength	ASTM D4632
Grab Elongation	ASTM D4632
Trapezoid Tear Strength	ASTM D4533
Puncture Resistance	ASTM D4833
Mullen Burst Strength	ASTM D3786
Water Flow Rate	ASTM D4491
Permeability	ASTM D4491
Permittivity	ASTM D4491
U.V. Resistance	ASTM D4355
Apparent Opening Size	ASTM D4751

B. Manufacturer's Installation Requirements

C. Samples

D. Certifications

E. Test Reports

1.06 QUALITY CONTROL

A. The Contractor shall furnish certified test reports with each shipment of material attesting that the geotextile meets the requirements of this specification. A sample of 5 square yards of geotextile from each shipment shall be furnished to the Engineer. Samples shall be provided at no cost to Engineer or Owner.

B. Geotextile for the liner system shall consist of 100 percent polypropylene nonwoven needlepunched fabric and exhibit the following properties, at a minimum.

PART 3 - INSTALLATION

3.01 INSTALLATION

A. The geotextile shall be installed per the manufacturer's requirements.

[END OF SECTION]

SECTION 13270

SUPPLEMENTAL CONDITIONS FOR EARTHWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary to perform all earthwork as specified herein, as shown on the Drawings, and as necessary to complete the project.

B. This Section specifically addresses earthwork related to work specified in Sections 13100 and 13200. The requirements specified are intended to clarify the requirements of Sections 13100 and 13200 but in no way relieve the Contractor of performance requirements set forth in those Sections. Work covered includes, but is not limited to, placement of permeable material over liner, placement of excavated material to be processed and subsequently placed in the processed soil stockpile and/or soil cell, returning treated soil to excavation, and removal and placement of subgrade preparation soil into excavation.

1.02 RELATED SECTIONS

A. Section 01600 - Protection of Work and Property

B. Section 01050 - Field Engineering

C. Section 02110 - Clearing, Grubbing, and Topsoil Removal

D. Section 02220 - Excavation

E. Section 02900 - Fertilizing and Seeding

F. Section 02931 - Dust and Erosion Control

G. Section 13400 - Water Storage, Treatment, and Disposal

H. Section 13250 - Supplemental Conditions for Geomembrane Liner Use

I. Section 13260 - Supplemental Conditions for Geotextile Use

1.03 REFERENCES

A. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

1. Latest version of American Society for Testing and Materials (ASTM).

a. D 422 - Test Method for Particle-Size Analysis of Soils.

b. D 698 - Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft^3).

c. D 1140 - Test Method for Amount of Material in Soils Finer than the No. 200 Sieve.

d. D 1557 - Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft^3).

e. D 2216 - Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures.

f. D 2487 - Test Method for Classification of Soils for Engineering Purposes.

g. D 4318 - Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

2. Mississippi Standard Specifications for Road and Bridge Construction, 1990.

1.04 QUALITY CONTROL

A. Permits and Regulations

1. The Contractor shall perform earthwork in compliance with applicable requirements of governing authorities having jurisdiction.

1.05 SUBMITTALS

A. Test Reports - Earth Materials:

1. The Contractor shall submit copies of reports to the Engineer of the items identified for each material under Section 2.0 of this specification.

B. Submit samples of all earth materials as required within this specification.

C. Submit information on equipment to be used to place soil in soil cell.

D. Submit information on compaction equipment to be used on the Project.

E. Submit name and address of all aggregate and borrow sources to be used, including a copy of certification indicating that all materials have been analyzed and are "clean" based on the results of TCLP tests. In addition, materials shall be tested and results reported for TCLP.

PART 2 PRODUCTS

2.01 FILL MATERIAL

A. Fill material (e.g., fill for soil cell, processed soil and stockpile, and mix area subgrade preparation shall consist of well-graded natural soils that are free of debris, foreign objects, excess silt, roots, stumps, trees, sod, muck, marl, frost, and organics. Maximum particle size shall not exceed 2 inches in any dimension. Fill material shall be capable of meeting the compaction requirements specified in Part 3 of this specification.

B. Fill material having a USCS classification of SM, SC, or CL shall have a maximum plasticity index of 25. Material shall be well graded and stones shall not exceed 2 inches in the greatest dimension.

C. Material Sources:

1. The Contractor shall submit a sample of the proposed material for approval by the Engineer. At the discretion of the Engineer the following tests may be requested and the Contractor shall employ a testing laboratory to carry out the tests.

a. Mechanical Gradation (Sieve Analysis)	ASTM D 422
b. Atterberg Limits	ASTM D 4318
c. Modified/Standard Proctor Compaction Curve	ASTM D 1557/698
d. Classification	ASTM D 2487

2. The final approval of a source for fill materials will be at the sole discretion of the Engineer.

2.02 DRAINAGE LAYER

A. The Contractor shall furnish and place an aggregate drainage layer above the geomembrane of the soil cell, as specified herein and as shown on the Drawings. The aggregate shall consist of pea gravel. The pea gravel shall be clean, washed, naturally rounded aggregate with a mix of particle sizes that pass a 3/8-inch sieve and are retained on a No. 8 sieve.

B. The Contractor shall submit documentation including mechanical gradation to confirm that material is in accordance with the specification. A minimum of one test shall be performed on the material by an independent testing laboratory.

2.03 AGGREGATE MATERIAL FOR MIXING WITH CONTAMINATED SOIL

A. The Contractor shall furnish and mix gravel and sand, or a premixed combination of the two into the excavated contaminated soil. The mix ratio and whether the sand and gravel will be mixed separately will be determined after the completion of the Full-Scale Soil Processing Test.

1. Gravel shall conform to MSDOT specification 703.03, Size No. 57 Coarse Aggregate for Portland cement concrete.

2. Sand shall conform to MS specification 703.02 fine aggregate for Portland cement concrete.

3. Premixed aggregate consisting of sand and gravel meeting the general requirements of MS specification 703.02 and 703.03 respectfully. The gradation requirements of the premixed aggregate shall conform to the following:

Square Mesh Sieve	Percent Passing by Weight
1-1/2 inch	100
1 inch	80 - 100
1/2 inch	25 - 60
No. 4	12 - 20
No. 8	8 - 15
No. 100	0 - 5

B. The Contractor shall submit documentation including mechanical gradation to confirm that the material is in accordance with the specification. A minimum

of two tests shall be performed on the material by an independent testing laboratory.

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor shall provide the Engineer with sufficient time and means to examine the areas and conditions under which excavating, filling, and grading are to be performed. The Engineer will examine the areas and conditions under which filling and grading are to be performed and notify the Contractor of conditions he may find that are detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner.

3.02 BACKFILLING

A. The subgrade preparation for the processed soil stockpile, soil cell, and mixing area shall be constructed without cutting into the top soil.

B. Fill material is to be placed in loose lifts that results in a compacted lift thickness of no more than six inches.

C. Each lift of fill material shall be compacted to 90 percent maximum dry density as measured by ASTM D1557.

D. Material shall be placed by the Contractor in a uniform lift and thoroughly compacted by compaction equipment suitable for the material encountered, to obtain the required density prior to the placement of succeeding lift. Each lift may be tested by the Engineer for proper compaction before successive lifts are applied.

E. If the required density is not obtained, compaction of the material by the Contractor shall continue until specified densities are obtained, before any additional material is placed.

F. Where required, the Contractor shall, at his expense, add sufficient water during the compaction effort to assure proper density. If, due to rain or other causes, the material exceeds the optimum moisture content for satisfactory compaction, it shall be allowed to dry, assisted by discing or

harrowing or other suitable means, if necessary, before compaction or filling effort is resumed.

3.03 DRAINAGE LAYER PLACEMENT

A. The drainage layer in the soil cell shall be placed on the previously installed layer of geomembrane and geotextile. Light-contact-pressure dozers shall be used to spread the material in a uniform one foot layer. The material shall be placed without damage to the underlying geomembrane. The material should be lifted and tumbled forward so as to minimize shear forces on the underlying geomembrane.

B. Protection to the drainage layer shall be provided by installing geotextile and placement of one foot of select processed soil for the soil cell and stockpile.

3.05 GRADING

A. The amount of soil and added aggregate to be placed into the original excavation will be more than what was taken out. The excess material shall be graded to provide stormwater runoff.

B. Finish surfaces shall be uniform and free from irregular surface changes.

3.06 PROTECTION OF WORK

A. The Contractor shall use all means necessary to protect all prior work, including all materials and completed work of other sections.

B. In the event of damage, the Contractor shall immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

[END OF SECTION]

SECTION 13400

WATER STORAGE, TREATMENT, AND DISPOSAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall furnish all labor, materials, supervision, transportation, installation, and equipment necessary for collecting, sampling, analyzing, and treating and/or disposing of water from the excavations, processed soil stockpile, soil cell, and mixing area as specified herein, and as necessary for completion of the project.

B. Water collected shall be stored for subsequent on site treatment and discharge or for hauling to an approved off-site facility for treatment and disposal.

1.02 RELATED SECTIONS

A. Section 01060 - Regulatory Requirements

B. Section 01600 - Protection of Work and Property

C. Section 13100 - Soil Processing

D. Section 13200 - Soil Cell Treatment

E. Section 13500 - Off Site Disposal of Waste

1.03 SUBMITTALS

A. Contractor shall submit a plan for water collection, storage, and on site treatment and for off site treatment and disposal. Plan shall include drawings to scale, of water collection, storage and on site treatment illustrating plan, cross sections, and details of system and how it is to be used at the site.

B. The plan shall describe the manner in which water will be treated to achieve specified effluent limits for on site treatment and discharge at the Randall Textron wastewater treatment plant outfall.

C. The Contractor shall present an option for off site treatment. As requested in the Bid Form, the Contractor shall provide a unit cost for off site

treatment. The Owner will chose which option will be used.

D. The following information shall be provided for an Owner-approved off-site water treatment facility: facility name, address, telephone number, EPA ID number, types of wastes they accept, analytical requirements, copies of permits, waste acceptance period, and treatment and disposal methods.

PART 2 MATERIALS

None

PART 3 EXECUTION

A. Water from within the excavation and the soil stockpiles, soil cell, and mixing area shall be collected and stored on site for subsequent on site treatment and discharge or off site treatment and disposal. The Contractor shall be responsible for the characterization of all water collected.

B. Sufficient water storage capacity shall be provided to accommodate storm events so that the excavation is kept dry at all times.

C. The Owner will obtain the required permit modification of the existing NPDES permit for on site discharge. Final discharge limits have not yet been provided by the Mississippi Department of Environmental Quality. The Contractor shall assume, until MDEQ limits are provided, that water shall be treated to the appropriate limit for trichloroethene and other organic and inorganic constituents, oil and grease, pH and suspended solids prior to discharge at the Randall Textron Wastewater Treatment Plant outfall. The level of treatment shall be the lowest of the current state or federal surface water quality criteria as identified in the Mississippi Water Quality Criteria for Interstate and Coastal Waters (MPWPCC, 1992) and Clean Water Act (CWA) Ambient Water Quality Criteria, respectively. Removal of Suspended solids in the treated water shall be less than or equal to 30 mg/l at all times. Oil and grease shall be treated to less than or equal to 5 mg/l at all times.

D. The Contractor shall be responsible for sampling and analysis to characterize the water and ensure the proper operation, maintenance, and performance

of the treatment system. The Contractor will be responsible for all unauthorized releases to the environment.

[END OF SECTION]

SECTION 13500

OFF-SITE DISPOSAL OF WASTE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall furnish all labor, materials, supervision, transportation, and equipment necessary for collecting, analyzing, and disposal of material that cannot be placed into the excavation including: untreatable residual waste taken from the excavation (i.e., scrap metal, drums, etc.), residue from soil and water treatment operations, construction debris from the removal of the temporary structures, and other site related construction debris, as necessary for completion of this project.

B. The work shall include proper on site storage of generated waste, sampling and analyzing for proper characterization of all waste that will be disposed of off site, identification of an Owner approved disposal facility, loading and hauling of the waste, and disposal of the waste at the approved facility. A list of Owner-approved facilities is attached.

1.02 RELATED SECTIONS

A. Section 01060 - Regulatory Requirements

B. Section 01500 - Construction Facilities and Temporary Controls

C. Section 01600 - Protection of Work and Property

D. Section 13400 - Water Storage, Treatment, and Disposal

1.03 SUBMITTALS

A. Submit a plan for waste material handling, storage, sampling, analysis, and disposal. Contractor shall indicate in plan manner and location in which materials will be stored, methods for further processing (e.g., decontamination), sampling and analysis methods, and any other pertinent information.

B. The following information shall be provided for the off site disposal facility: facility name, address, telephone number, EPA ID number, types of wastes they

accept, copies of permits, analytical requirements, treatment and/or disposal method, and waste acceptance period.

PART 2 MATERIALS

None

PART 3 EXECUTION

A. The Contractor shall provide environmentally protective on-site storage for each type of waste generated.

B. Residual waste (i.e., treatment residue, scrap metal, drums, construction debris, etc) removed from the excavation which cannot be treated shall be properly disposed of off site by the Contractor. The Contractor will be responsible for proper waste characterization. Disposal shall be at an appropriate Owner approved facility, depending on the waste characterization.

C. Once characterized, Contractor shall provide Owner with properly completed manifest for proper authorization as generator for off site disposal.

D. Contractor shall conduct all on site waste management actvities such that all local, state, and federal requirements are met.

[END OF SECTION]